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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1893.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1893.

☞ SEE LAST PAGE OF COVER.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the "Boston Transcript." As here presented, the papers are printed in full, and the discussions are not only much fuller than in the weekly reports, but, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

O. B. Hadwen,
J. D. W. French,
C. Minot Weld,
Committee on Publication and Discussion.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 7, 1893.

A duly notified stated meeting of the Society was holden at eleven o'clock. The chair was taken by the President, WILLIAM H. SPOONER.

In the absence of the Secretary, the President appointed Miss Charlotte M. Endicott, Secretary *pro tem.*

President Spooner then delivered his valedictory address, as follows:

ADDRESS OF PRESIDENT SPOONER.

Ladies and Gentlemen: In retiring from the position with which you have honored me, I wish to thank you all for the pleasant relations which have existed between us, and to rejoice with you that your united efforts have continued and developed the prosperity of the Society.

Our mortgage debt is virtually cancelled, and our building has been put in good order, with new drains very thoroughly constructed; also the upper hall has been provided with new seats, making both halls now in excellent condition for public meetings.

We have had the encouragement of a largely increased attendance at our meetings for discussion, and the interest has been greatly stimulated by interchange of experiences,—a strong factor in every work.

The printed TRANSACTIONS, which at the time of my coming into office had been delayed by the fire and various causes, have now,

with additional temporary help to our able and valued Secretary, been brought up to the second part of 1892, and placed in the hands of members through the mails, a measure which strengthens the general interest in the work and must be a convenience to those members of the Society who are not able to attend its meetings, or visit the Library.

Although the Library room was enlarged in 1889, the added shelf-room has already been filled, and the Committee in charge are asking for more. One of the marked features of our growth is the greater magnitude of our weekly, as well as our special exhibits, but in the latter we are often unpleasantly confronted with the fact that our hall space is quite inadequate to do justice to our contributors. The great Plant Exhibition held by our Society in Music Hall, in August, 1890, was one of the finest ever seen, and will long be remembered by all who witnessed it; a new infusion of zeal and enterprise seemed to follow this grand display, being manifested in our succeeding shows. The Society's appropriations for prizes and gratuities have increased from $6,000 in 1890 to $7,850 in 1893.

We find the additions to membership nearly balanced by the depletion from death and withdrawal. In 1890 there were added 12 life and 7 annual members, making 19; previous to that, the enumeration of deaths or withdrawals was not kept separately for each year. In 1889 and 1890 the number of deaths of life members was 21, and of annual members deceased and dropped 12. In 1891 the life membership addition was 15, annual 19, deaths of life members 21, and from annual members, deaths and withdrawals, 11. In 1892 there were added, life members 17, and annual members 23; while 28 life members died, and among the annual members were 11 deaths and withdrawals.

One of the prominent points in the past three years was the revisal and amendment of the Society's Constitution and By-Laws, which was done in July, 1891.

Within a few days the sum of $10,000 was invested in a sinking fund, and the Treasurer's account, December 31, will show a cash balance of $12,417.19 including $5,397.78 received from Mount Auburn Cemetery.

With entire confidence in your enlarging future prosperity I have the pleasure of introducing President Nathaniel T. Kidder.

Address of President Nathaniel T. Kidder.

Ladies and Gentlemen of the Massachusetts Horticultural Society: I realize that I have undertaken a great responsibility in accepting the office of President of this Society, a Society now nearly sixty-four years old. But it is not of its past that I am expected to speak today, but of its future, and I hope that I may find some detail in which I can improve it.

As I come to the chair the cry on all sides from all the Committees is for more room. When the first Committee said to me "we want more room," I could not help seeing that it did need more, nor could I help thinking that the claim of the next Committee was equally well based. The Society does need more room. Its present quarters are cramped and inconvenient — outgrown.

Often you have appointed a Committee to consider the suggestions of your incoming President, and perhaps you will deem it advisable to do so this year. I would like to suggest that your Executive and Finance Committees be requested to bear in mind the increasing need for space for the proper carrying on the work of the various Officers and Committees and report to the Society if they can find any suitable site where we might build or otherwise acquire such accommodations as would meet the requirements of a growing society, with a growing library, with growing exhibitions, in a growing city. If the subject were thus referred to these Committees, which you have formed of men selected from your number as pre-eminently interested in, and able to conduct your affairs, it could be considered carefully and not hurried through.

When I said just now that the Officers and Committees need more room I meant to include the demands of the Library which, indeed, it hardly seems as if I need urge again, as I think you must all appreciate how rapidly the collection of books increases and how many volumes it is still desirable to add from what has already been published, to say nothing of acquiring such works as are printed from year to year as may aid us in our work or recreation. Growth is imperative to keep up the interest, the value, of the Library! I leave the Library Committee with regret, but hope that you will respond to the appeal which I have made for a more generous lodging for the books. I am bound to

say further that I do not consider the Library sufficiently protected against fire, even though at the time the gallery was added such precautions as could be taken were taken to make the room partially—*partially* fireproof.

A busy horticulturist has not time to study entomology. But could not we, as a Society of many members, conduct a branch which would facilitate a familiarity with insects and methods of destroying them? Much time must be wasted in experimenting with the extermination of garden and greenhouse pests which could be saved if we had a ready means of determining species and learning what insecticides were in best repute for exterminating particular insects. We have had exhibited in our rooms the gypsy moth in its various stages, but there are many other destructive insects which might well be shown in a like manner, to call our attention to their various transformations and enable us to guard against our assailants more intelligently.

I think most of you feel that our exhibitions are not all as well attended as could be wished. Is not this partly because there is not enough variety from year to year? One of the most interesting exhibits which I noticed during the past year, partly because so unusual, was a collection of herbs. I am sorry to say they were in a far corner and without their names attached. And this leads me on to the careful labelling of plants and flowers shown, and I must say that I think we ought to be more careful about this, and insist that everything should conform to the printed rule.

Let us not run any risk in our essays and discussions of revolving in too limited a circle. It were better that some papers seem beyond our province than that we fail to consider anything which could have any bearing whatsoever on our primary subject of Horticulture. I feel sure that the Committee which has this in charge would be glad of suggestions of topics or speakers, and I feel certain that the Committee of one year is enough in accord with that of the previous year to receive gladly such suggestions as might be put in the records for want of time or opportunity to carry them out.

I wish further to suggest that your Window Gardening Committee be proposed by the Nominating Committee named by your President, and voted for at the same time and in the same manner as the other officers of the Society; such alterations

being made in the Constitution and By-Laws as this change would necessitate.

We have a good deal of routine business before us, as this is the first meeting in the year so I will not take more time, but let my deeds take the place of words, trusting that I make the good impression at the end of the year instead of at the beginning.

I rely on the help of the Society, collectively and individually.

Robert Kent James, of Dorchester, was proposed by Henry W. Wilson as an Annual Member of the Society.

Francis H. Appleton read the report of the Committee appointed at the last meeting to consider the extermination of insect pests; also the draft of a bill designed to effect that object. He then moved the following vote:

Voted: That a Committee of three members of the Society be appointed, who shall be empowered to appear before any Committee of the General Court of 1893, in advocacy of such legislation for the suppression of insects as they may deem advisable.

After remarks by Benjamin P. Ware, William H. Spooner, Leverett M. Chase, and William C. Strong, on motion of J. D. W. French, it was voted, that the report, with the recommendations, be accepted. It was also voted that the same Committee be continued and requested to appear before the Legislature.

On motion of Leverett M. Chase it was voted that a Committee of three be appointed by the Chair to secure a portrait of the retiring President. The Chair stated that he would announce the Committee hereafter.

The President reported from the Executive Committee a recommendation that the Society make the following appropriations for the year 1893:

For Prizes for Plants, ...	$2,050
" " " Flowers, ...	2,400
" " " Fruits, ...	1,800
" " " Vegetables, . . .	1,100
" " " Gardens, ...	500
Total for prizes, ...	$7,850

For the Committee on Window Gardening, this sum to cover all incidental expenses of that Committee, and to be paid through the regular channels, ...	$250
For the Committee of Arrangements, this sum to cover all extraordinary expenses of said Committee, .	400
For the Committee on the Library, for the purchase of Magazines and Newspapers, Binding of Books and incidental expenses of said Committee, . .	300
For the same Committee, to continue the Card Catalogue of Plates, ...	100
For the Committee on Publication and Discussion, including the income of the John Lewis Russell Fund,	300
For the salaries of the Treasurer and Superintendent, the Secretary and Librarian, and the Assistant to the latter, ...	3,600

These appropriations were voted unanimously by the Society.

The President also announced the appointment by the Executive Committee, of Robert Manning as Secretary and Librarian, and Charles E. Richardson as Treasurer and Superintendent of the Building, for the year 1893.

J. D. W. French moved that a Committee of three be appointed to consider the suggestions contained in the address of President Kidder, said Committee to be appointed by the Chair.

William H. Spooner offered an amendment to the motion, providing that the suggestions concerning the Library and Building be referred to the Executive Committee. Mr. French's motion, as thus amended, was carried, and the President stated that he would announce the Committee at the next meeting.

Joseph H. Woodford announced, by request of the Committee on Plants, the election of David Allan as Chairman of that Committee, to fill the vacancy caused by the resignation of Frederick L. Harris.

The President announced that the Schedule of Prizes for 1893, and the Programme of Meetings for Discussion, were printed and had been sent to the members of the Society.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society:

Mrs. George M. Coburn, of Boston,
Thomas Westwood, of Jamaica-Plain,
Robert Graham, of Reading,
Bernard P. Verne, of Lynnfield Centre.

Adjourned to Saturday, January 14.

BUSINESS MEETING.

Saturday, January 14, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

Lawrence Cotter, of Dorchester, was proposed by Charles E. Richardson, and Amos M. Leonard, of Boston, by Leverett M. Chase, as members of the Society.

Mrs. H. L. T. Wolcott, Chairman of the Committee on Window Gardening, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication.

The President announced the Committee to obtain a portrait of the retiring President as follows: Leverett M. Chase, Samuel Hartwell, and Benjamin G. Smith, and

The Committee to consider that part of the Annual Address not referred to the Executive Committee, as J. D. W. French, Samuel H. Scudder, and Bradford Torrey.

Francis H. Appleton read a circular from George M. Robinson, of Elmira, N. Y., containing a draft of a bill prepared by him, for the reduction of postage on matter pertaining to Agricultural and kindred societies. Mr. Appleton offered the following vote:

Voted, That the Secretary be instructed to notify the promoter of this bill of its approval by this Society, and request that the printed matter sent through the mails by Horticultural Societies, in promotion of the objects for which they are incorporated, be included in the bill.

The vote was unanimously passed.

Adjourned to Saturday, January 21.

MEETING FOR DISCUSSION.

Village Improvement.

By B. G. Northrop, LL.D., Ex-Secretary State Board of Education of Connecticut, Clinton, Conn.

The inscription on the marble tablet at the entrance of this Horticultural Hall, shows what ground the Massachusetts Horticultural Society has to be proud of its history from the very outset. That mural record fitly claims the notice of every visitor to these words:

To the
MASSACHUSETTS HORTICULTURAL SOCIETY,
the community is indebted for
MOUNT AUBURN CEMETERY:
the foundation and consecration of which
was one of its first acts,
and in whose improvement, embellishment and
preservation, it has a perpetual interest.

It is a great honor to this Society that the first successful effort to secure a rural cemetery on a liberal and comprehensive plan, in this country or in any other land, was made under its auspices.

Mount Auburn Cemetery was established in 1831. Although the custom of sepulture outside of cities, in gardens and groves, prevailed among the Jews, the Egyptians, the Greeks and Romans, and Eastern Christians and the Turks, and even from the times of the patriarchs down to our day, no ornamented rural cemetery on the scale of Mount Auburn could then be found in the United States nor even in the world. It contains an area of 125 acres of native woodland. The granite tower, sixty-two feet in height, which crowns the principal eminence of this area, commands one of the finest prospects in the environs of Boston, and shows that the grounds have been laid out with true landscape art, giving the aspect of a "well managed park, the lots being only so far ornamented with shrubs and flowers as to constitute rich borders to the avenues and pathways." Mount Auburn was not only the pioneer, but the model, of the many beautiful cemeteries now found near our larger cities. The expenditures of the Massachusetts Horticultural Society for Mount Auburn Cemetery have proved a profitable investment as well as a leading factor in cultivating public taste in the line of

landscape gardening and rural adornment. The fact of over $5,000 received the last year from the sale of Mount Auburn lots is one of many illustrations in point. The present interest of the Society in Arbor Day, and in Village Improvement, is therefore in keeping with all its most useful history.

Massachusetts has long taken a prominent part in village improvement. The first incorporated improvement society was the Laurel Hill Association of Stockbridge, formed in 1853, by Mary Hopkins, a kinswoman of Dr. Mark Hopkins, who ever showed a deep interest in its plans for the benefit of his native town. Its anniversary — happily observed for forty years, with social reunions, orations, poems, or post-prandial speeches — has proved an attractive and useful festival to Stockbridge and Berkshire County. Its influence has extended widely over Massachusetts and the country.

The Public Green Association, formed by Hon. James Hillhouse about one hundred years ago, in New Haven, when it was a rural town, is a good illustration of an improvement society, short-lived and yet surviving in an influence steadily increasing and greater now than ever. Though Mr. Hillhouse was the benefactor of New Haven and of Yale College in many other ways, his richest legacy was the lessons of civic pride and local patriotism which have so long inspired its citizens, making it a city of beautiful homes, favoring liberal appropriations and inviting large gifts for parks and public improvements.

It may seem like carrying coals to Newcastle to address a Boston audience on town improvements, for this city has not only been long celebrated for its manifold attractions, but also for its beautiful surrounding villages, stretching out on all sides for twenty miles or more. Where in this land or any other is there a city of its size environed with such a circle of beautiful towns? How much has recently been done towards realizing the glowing picture of Sylvester Baxter, who, a dozen years ago, said, "The ideal suburbs of the future will consist of clusters and groups of beautiful and happy homes encompassing the great city like a garden, the villages nestling among park-like surroundings, while pleasant drive-ways connect beautiful hills and lakes and streams on every side with each other, making the circuit from Nahant to Nantasket an uninterrupted round of joys to the eye." "The great parkway stretching from the end of Commonwealth Avenue, passing

through the Back Bay Fens, embracing Jamaica Pond, skirting the Arnold Arboretum and Franklin Park, and finally reaching the Marine Park in South Boston, when completed, will be the great feature of the system and will furnish a continuous and interesting drive of about fifteen miles." How grand will be that park system of Boston, when it shall also include the Middlesex Fells north of the city, and the Blue Hill range on the south!

This Village Improvement movement initiated in Massachusetts, has spread across the continent so that no state is now showing greater interest in it than California. Even to a stranger visiting that state, it seems to be in the air, as a wholesome epidemic. Proofs of its prevalence meet one on every hand. Borough organizations spontaneously glide into improvement societies. The practical and economic value of sanitary and æsthetic betterments there, goes without saying. Climate, soil, salubrity, irrigation, town-pride, ambition to make one's place a residential town or winter resort, happily combine to intensify this sentiment in many portions of the Golden State.

The chief object of these societies is to make the environments of the home and the village healthful and attractive. Grand as are the palaces of the nobility in Europe, the homes of Americans in comfort and taste surpass those of the people in any other land. Of the many causes of the recent progress in this line, the improvement societies now doing their benign work widely over our country are not the least. Their influence has by no means been limited to the towns or counties where they have been organized, for the discussions they have prompted, the plans and ideals thus advocated by the press of the country, have benefited and brightened myriads of isolated homes, even where no improvement societies have yet been formed.

The dwellings of any people tell their condition and character, their education, thrift, and ambition, or sloth and debasement. In all ages and countries, the homes of the people have been the index of their barbarism or civilization. Christianity has ever marked its triumphs over paganism by improving the homes of its converts. The multiplied ministries of nature, providence, and religion centre in the maintenance of happy homes. It has long been my ambition to help in improving the homes and home life of the people. When one strives to realize the true ideal and

makes his home his pet and pride, that noble aim brings new cheer and inspiration for his daily duties.

But there still remain desolate dwellings innumerable, where flowers, vines, or trees, with a lawn, would make the wilderness blossom as the rose. Slatternliness in and around the house repels from their country homes, many youth who might otherwise be bound in strongest ties to the fireside.

The most progressive towns are most conscious of remaining defects and, therefore, most appreciative of organized efforts for the general good. Our best towns without an improvement society often fall far short of what they might be and ought to be, for in them, here and there, are unsightly private grounds and dwellings which give an air of shiftlessness, sadly marring the effect of an otherwise beautiful village. Wherever an improvement society develops town-pride and public spirit, such defacements disappear. When every citizen is thus stimulated to make his own wayside free from rubbish and neat and attractive, the whole town becomes so inviting as to give new attractions and value to all its homes.

It is high praise to any people that they fondly cherish their homes. Even a stranger can hardly drive through such a town without saying, "Here are people of refinement who tastefully guard the surroundings of their daily life." These surroundings, trifling as they may seem, are constant and vital forces. Clearing up and dusting are little matters in housekeeping, but how soon would the house become forbidding, were these trifles neglected! Just so in a village; let minor matters be slighted and the comfort, content, reputation, and prosperity of a whole community suffer. But, worst of all, home life suffers and character deteriorates. Modern civilization relates to the homes and social life of the people — to their health, thrift, and intellectual and moral advancement.

In earlier ages men were counted in the aggregate and valued as they helped to swell the revenues or retinues of kings. The government was the unit, and each individual only added one to the roll of soldiers or serfs. Happily for us, the family is the unit of the state, and government is for the people as well as by the people. This gives to the concrete, all the characteristics that make the home beautiful. Thus love of home is primary patriotism.

When recently surveying a town in order to adapt my lecture to local needs, as we passed a large house and spacious barns, with neglected surroundings, my escort said, "Here lives the richest and meanest man of our town. Twenty years ago, he brought here a refined young lady as a bride. It was her ambition and delight to adorn her new home without and within. At length her strong, innate love of the beautiful was cruelly crushed, for this heartless wretch 'would no longer permit such waste of her time on good for nothing posies.' Driven to despair, she has been for years in the State Asylum among the incurably insane."

When in Nebraska City, the guest of Ex-Governor J. Sterling Morton,* of Nebraska, I found a happy contrast to this miser's wretched home. To this state, then a territory, just ceded by the Indians to the United States and still a wilderness, he brought his bride, a cultivated lady from Detroit, who bravely made the best of their log-hut. Soon flowers, shrubs, and vines sprang up on every side, until at length a veritable Eden — largely planted and tilled by her hands — surrounded her humble cabin. In a few years, a stately mansion, beautiful within as without, rose in its place,— its choicest adornments being her own artistic work. How much did her love of the beautiful and her purpose to create this paradise, on which her heart was set, when she first saw this spot and saw too its possibilities, lighten the burdens and lessen the privations of a pioneer life. Bright visions of a beautiful home were an inspiration and a benediction to that happy household years before they were realized. It seems fitting that such a home, fitly named "Arbor Lodge," should be the birthplace of Arbor Day. Never has there been so universal mourning at the death of any private citizen of Nebraska City, as when the queen of that happy family was borne to the new cemetery which she was foremost in securing and adorning.

Tree planting, however important, is by no means the leading aim of these improvement societies. There are towns in which the axe-man is needed as well as the tree-planter. There are streets, parks, and home-yards, too densely shaded. Large trees

*Now Secretary of the United States Department of Agriculture. Never did any private citizen of Nebraska receive such an ovation from men of all parties as did Secretary Morton on returning home after receiving this nomination in Washington.

in little yards close to the homes — especially the beautiful hemlock or denser Norway spruce — are unwholesome. There is need of iterating the old motto, "Where the sunlight can't come, the doctor must."

It is a good omen that interest in the embellishment of rural homes is so widely extending and that the varied charms of the country, with its superior advantages for the physical, mental, and moral training of children are attracting so many to the simpler employments and enjoyments of suburban towns or of rural life. There the home naturally becomes the first and chief place to promote love of flowers, vines, shrubs, and trees by cultivating them, and then the better place to cultivate home affections, provide home enjoyments, and foster home courtesies. In the every-day intercourse of home, there should be a more sacred observance of the amenities of life and a freer interchange of kindly feeling. As flowers seem worthless only to the senseless, so the morning and evening salutations in the family may seem little in themselves, but when fitly observed they are mighty in their influence because they are daily — yes, constant — factors in forming character. As the sunbeam is composed of many minute rays, so the home should be illumined and brightened by Nature's richest hues without; and still more within, by winning smiles, cordial greetings, sweet laughter, and nameless little kindnesses. Such beauties of Nature and art, such amenities and affections, should be the sunshine of every home. They refresh and purify the social circle. Like the clinging vine, they twine themselves around the heart, calling forth its purest emotions and securing its most healthful activity. Such a home is worthy the name "an ordinance of God." Such a home here is the true school for a better home above.

If parents combine to make the circle of home life beautiful without and within, they will sow in the hearts of their children the seeds of truth, kindness, and fidelity, from which they may reap a harvest of happiness and virtue. The memory of a beautiful and happy home and a sunny childhood is one of the richest legacies parents can leave to their children. The heart will never forget its hallowed influences. It is a fountain of enjoyment to which the lapse of years will only add new sweetness. Such a memory is a constant inspiration for good and restraint from evil. If taste and culture brighten our homes and adorn our grounds

and music adds its charms, our children will find the healthful pursuits and pleasures of rural homes more attractive than the glare and whirl of city life. Such early occupations and enjoyments tend to invest home life and school life and all one's future with new interest and value and joyousness, for life is ever what we make it.

Though far more has been accomplished in this line than I ever expected to witness when enlisting in the service twenty-five years ago, yet compared with the public needs and the rich opportunities for results now opening widely over the land, this work seems just begun. Instead of one person making it his vocation, there is room for scores of workers in this rich field. This cause has indeed enlisted the hearty sympathy and coöperation of many of the ablest and best men in the land and especially of clergymen, irrespective of sect, for they early realized that its social, educational, moral, and religious bearings are even more important than the financial gain. They have been the foremost advocates of the cardinal idea that in the home is the lever which is to lift up humanity.

The aims of these associations vary in different towns with local needs, and include public health, especially the sanitary conditions in homes and their surroundings; roads, roadsides, sidewalks, school and church yards, cemeteries, parks, and other public lands, as well as private estates; the grounds around railway stations, lighting and parking streets; providing drinking troughs, tanks, or fountains; organizing free town libraries; removing nuisances and front fences, and doing whatever else the exigencies of a town may suggest for its growth and betterment. They often serve the purpose of boards of trade in cities, and in all they help promote good fellowship and invite general coöperation.

The charm of country life, so dependent on neighborly courtesies, is often marred by needless alienations and wrangles. It tends to harmonize a community when all classes work together for common objects, and differences of rank, sect, or party are forgotten. Then neighbors and fellow-townsmen will think more of one another, more of their town, and, best of all, more of their homes. These associations foster that public spirit and town pride which naturally invite liberal plans and gifts. They impressively put to every citizen the question, "What do I owe to my town, what is it my duty, or rather my privilege to do for it?"

The sentiment that cherishes one's homestead and town is noble and ennobling, and has characterized the greatest and best men the world has ever seen. The man who cares not for his native town nor for that of his adoption, has no heart in his bosom. An example is found in an American railway king, a millionaire, never showing interest in his adopted or his native town, leaving his old homestead neglected and forlorn. Such a fact suggests a selfish soul, sterile in all heroic virtues. Patriotism and philanthropy never thrive in the soil which produces no local attachments.

Each town therefore needs to be distinctly conscious of itself, jealous of its honor, preserving its history, keeping up that just pride for its past which is an inspiration for the future, realizing that it has a life as definite in development as does an individual, and therefore cultivating true local ambitions and elevating local ideals.

Under such appeals, large gifts are often made to village improvement societies, not only by citizens, but by natives, now non-residents. Rich men would oftener respond to these calls, were the need duly presented. Large sums come in pleasant surprises from them, so that the membership fee is only one of the smaller rills that fill the treasury Are there not thousands of wealthy men all over this land, who, as they learn of the improvements going on in their native towns, will be glad to show their substantial sympathy? From such liberal non-resident natives, I often receive the response, "Let me share in the good work going on in the home of my youth." Such men gratefully remember how much they owe to the scenery, employments, and varied influences of rural homes. How many have lately learned the wisdom of giving while living, and especially of giving to their own towns, where they can see and enjoy the results. It has been a privilege to meet so many men who identify themselves with the interests of their towns and enrich their own lives by their generous devotion to the public weal. What a contrast such characters present to the grasping and avaricious niggard, unhappy and unloved in life and unmourned in death!

Village improvement is often carried on by individual as well as by organized efforts, where a citizen or a family of liberal views and large means, become the benefactors of their towns by gifts for libraries, cemeteries, parks, fountains, memorial halls, schools, or other institutions and improvements. Massachusetts is full of

such examples, of which I can here name but one. Easton, especially North Easton, has been enriched by the enterprise and munificence of the brothers, Oliver and Oakes Ames, and their sons. The Battell family have greatly beautified and improved their native town of Norfolk, Connecticut, and thus enriched their own lives as well. The Fairbanks families, to the third generation, in St. Johnsbury, Vermont, have had a like happy experience.

Faribault, Minnesota, furnishes a suggestive example of the priceless value to any town of a single wise, far-sighted citizen, though without money. When Rev. Henry B. Whipple, thirty-three years ago, was elected the first Bishop of Minnesota, the citizens of Faribault offered liberal inducements to secure his residence with them, though four years previously it was an Indian village, with a single frame house, the trading-post of the Indian Agent, Alexander Faribault. Bishop Whipple has proved a great benefaction to the town in manifold ways. Through his influence, the three great educational institutions of the Episcopalians in Minnesota, were located here — the Seabury Divinity School, the Shattuck School for boys, with a generous endowment from Boston, and St. Mary's Hall for girls. Through the same influence, here also are three important State institutions, one each for the blind, the deaf and dumb, and the imbeciles. The spacious buildings for these six institutions are beautifully located on extensive grounds — several hundred acres in all — which practically constitute a charming park for the citizens, open to all, with fine groves, lawns, statuary, winding drives, and walks. Bishop Whipple and his assistant, the Rev. J. Dobbin, Rector of the Shattuck School, are the embodiment of village improvement, and such confidence is placed in their taste and judgment that their recommendations are effective. Though I made an inspection of the town, as is my custom, in order to meet local exigencies, I found the "needs" less than in any other Western town of its size that I have visited. With admitted defects, it is justly called the "Model Town" of Minnesota.

My lecture occurred on the eve of the twenty-fifth anniversary of Mr. Whipple's bishopric. It was a privilege to hear the merited tributes to his great achievements in Church and State, and his success in the civilization and evangelization of the Indians, among whom he was known as "Straight Tongue."

His later work in awakening public interest in behalf of Indian Education has been of national importance and has probably influenced the action of Congress more than that of any other man except Senator Dawes. As an Indian missionary preacher, a trustee of the Peabody Fund, and as a wise and efficient Bishop, he is justly held in honor widely over the country, but in Faribault he is recognized as a great benefactor of the town by his noble character and personal influence. Often names honored abroad are tarnished at home. After mingling freely with the citizens, it was delightful to observe with what unanimity there was paid to him that heart-felt tribute of homage and affection which only a noble character and valued services can command. Too many men of equal culture and ability in suburban or rural towns, are so isolated and apart from their fellow-citizens as to leave little or no impress on the community. Bishop Whipple's example is fitted to make many others.

Among the minor aims of these improvement societies, are the providing of rustic seats under the shades for the comfort of pedestrians, pleasantly suggesting neighborly friendliness; securing watering-troughs for horses at convenient points where, from adjacent hill-sides, never-failing springs facilitate such kindness to animals; commending neutral tints for dwellings in place of the glaring white formerly so common; furnishing plans for rural architecture, and showing that the conditions of economy, taste, and convenience can be met without adopting an enlarged dry-goods box as the sole model; preventing nuisances like depositing rubbish along the streets, or painting advertisements on the rocks by the myriad nostrum venders, or the tearing up the turf fronting dwellings by inconsiderate road-menders. There is ample room for the needful work of the scraper, without making unsightly cuts in front of residences; or preventing enroachment upon the highway everytime the fence boundary is made. The removal of front fences should be cautiously advocated. On a large corner-lot, or on a great thoroughfare near a cattle-market, or in some towns in Southern Indiana and Southern Illinois, where the battle of the hogs and cows has never been fought, the fence is still essential. There the specious plea prevails, that the street or common is the poor man's pasture, so that the enforcement of a stock law would deprive him of his inalienable rights. But in an intelligent town, a fair discussion usually wins the victory for a

liberal policy. This has been tried in so many cases, east and west, that I confidently urge all villagers thus afflicted to contend for the abatement of this nuisance.

Many country towns, naturally salubrious, have suffered greatly from neglect of hygienic laws. Sanitarians say that at least one-third of the diseases of modern life are preventable, and that in our country, fully 120,000 deaths occur annually from preventable causes, and as there are on an average, twenty-eight times as many cases of sickness as of death, there are over three and one third million sicknesses from preventable disease. There has been a far greater advance in sanitary science during the last fifty years than in any previous century. But the *popular appreciation* of this science has not kept pace with its discoveries. The pressing demand now is the diffusion of the art of sanitation — the practical application of its methods — by the people at large. Lecturing in every township of Massachusetts and Connecticut, while for over twenty-six years serving these States, and also in most of the other States, I have often learned of the ravages of fatal diseases caused by impure air, impure soil, and impure water. Hence I always place among the objects of every improvement society which I organize, "the promotion of public health by securing better sanitary conditions in our homes and their surroundings." I often find faulty drains, or a stagnant pool under the kitchen window, or neglected privies, or cess-pools too near the well, or a cellar made foul by rats, cats, or decaying vegetables, tainting the air of the whole house. It is often difficult to convince householders of danger from their water supply, and yet I seldom inspect a country town, where there is not obvious need of the warning "Look carefully to your wells." In speaking of such defects, the utmost frankness is usually welcomed. In one town — a large summer resort — where I had made the usual survey of its needs, I described a stagnant malarious pool covered with green scum, not eighty feet from a dwelling-house, and not twelve-hundred feet from the church in which we were assembled, when the Chairman of the Selectmen rose and said, "That shall be drained in two weeks." I had hardly finished the description of a glaring defect of a different kind, when another gentleman made the welcome announcement, "That shall be remedied in two days." Hearty applause greeted these best speeches of the evening. Indeed I have seldom

observed any sign of displeasure at the description of the defects of a town, when courteously made for the purpose of remedying them. Watering-places naturally healthful sometimes become death-pools, when made the home of a dense crowd in the hottest months of the year. Usually such unwelcome discoveries are accepted as facts and the remedies applied, but sometimes they are treated as absurd alarms, and gross ignorance and carelessness hold their ground undisturbed.

Many village improvement societies have been efficient in securing free public libraries. Sixteen years ago, Pasadena in California was a wild ranch, and its only streets were sheep-paths. A "Village Improvement and Library Association" was organized twelve years ago, which formed wise plans for its lay-out and development. It now has fine broad avenues without front fences, lined with palms, fern-leafed peppers, English walnuts, and other choice trees. Its forty miles of stone sidewalks averaging eight feet in width are the best I have seen in any town of its size. It has no saloons, but so many improvements and so choice a community that it is fitly regarded as the model town of Southern California. Its beautiful library building owned by its improvement society, and its fine library are hereafter to be liberally supported by taxation.

The Free Public Library system of Massachusetts was originated in 1847 by Dr. Francis Wayland, President of Brown University, who tendered five hundred dollars to the little town named in honor of him, on condition that its citizens should raise an equal sum for a free town library — a condition promptly met. Dr. Wayland expressed the hope that the towns around Wayland would secure libraries. Such was the result sooner than he expected, for he builded better than he knew. All these towns— Framingham, Concord, Waltham, Weston, Natick, Sudbury, Sherborn— now have flourishing libraries. The words of President Wayland, emphasized by his gift, summoned attention to the need of public libraries. The press of Boston and of Massachusetts commended his views and his action. Edward Everett, Josiah Quincy, Jr., John P. Bigelow, and others helped by pen and tongue and purse in the scheme for the Boston Library, which owed its success to the fact that it had from the outset the counsel and patient thought and liberal support of the most eminent citizens of Boston.

Nothing reflects more credit upon Massachusetts during the last forty years, than the history of her free libraries. The act legalizing their support by taxation, enacted forty years ago, has stood the crucial test of experience. While for nearly eleven years agent of the State Board of Education, and visiting every town and advocating the organization of libraries, I seldom encountered objections to the library law. Massachusetts may well glory in the fact that it now has 307 free libraries, containing in the aggregate more than 2,500,000 volumes available for all of the 2,238,943 inhabitants excepting 45 of the smallest and poorest towns with a total population of hardly 60,000. There is no other equal area on this globe so well supplied with free libraries. Munificent gifts have been made to them in money — not including books —exceeding $5,500,000. Libraries have often been the cause or result of village improvement which so directly fosters public spirit.

Discussion.

Rev. Calvin Terry said there were many sides to the subject presented today — economical, educational, sanitary, civilizing. In the economical view, our gray-headed members can recollect when it was considered necessary, in our villages, to build at considerable cost, a picket, or some other style of fence, in front of every house, to protect the lawn, flower-beds, choice shrubs, or other decorative plants from the depredations of stray cattle or other animals which were allowed to range at large; and streets that were intended to be from thirty to sixty feet wide were rendered quite narrow by permitting the growth of wild shrubs and sometimes trees upon a wide margin on either side. These thoroughfares can be cleared, and, under the influence of the improvement societies, many have been thus treated, transforming them into attractive avenues, making them practically much wider in reality, as well as to the eye. And how much more decently children behave, when passing along a clean and beautiful highway! The educational influence of their surroundings is refining and elevating, and will tend to restrain both the smooth-faced boys and some bearded ones who do not outgrow their boyish propensities. But where the roads are neglected and dilapidated, the recklessness of youth finds vent in wanton destructiveness.

The sanitary aspect of the topic has been well treated by the lecturer. The temptation to throw garbage and dead creatures upon

the highway is removed when neatness prevails along the borders. Negligence and slovenliness in this regard will breed a pestilence in a village, while the thoughtless people wonder why it is so sickly.

The civilizing influence is substantially involved in the other three topics — especially the educational — for they tend to raise the tone of public sentiment and develop a higher standard of social life. Even the boyish ones will learn to appreciate beauty and to respect the rights and feelings of those whose premises are neat and fruitful.

This subject commends itself to all. But the people will not be willing to remove their fences unless they can have protection. The laws now require all to take care of their own cattle and horses, and to prevent unnecessary trespassing upon the highways; but — to say nothing more about marauding boys — what have we to prevent the depredations of dogs? Think of half a dozen dogs of from fifty to a hundred pounds weight, running at large over your lawns and gardens! So lawless and indecent as they are, I would as soon have a cow in my garden as such dogs. We need a law restraining them, — and I would suggest to the lecturer that he add a sentence or two to his lecture upon this topic and try to secure such enactments as shall protect the public from this nuisance.

Leverett M. Chase believed that we could not have any laws enforced that went much beyond the average spirit of the people. He was convinced that the best protection was more elevated thought and public sentiment; these would give protection when fences, even as high as the walls of Babylon, could not keep out the hoodlums. He declared that he loved dogs, but he knew there were very many of them that should be made food for grape vines and other fruit and vegetable plants. He was greatly moved by what the lecturer had said. Home is the garden where we are prepared for heaven.

Mr. Chase moved that a vote of thanks be passsed to Dr. Northrop, for his interesting and instructive lecture. The motion was unanimously carried.

O. B. Hadwen, Chairman of the Committe on Discussion, announced that on the next Saturday, Warren H. Manning, of Brookline, would present a paper upon "Landscape Gardening."

BUSINESS MEETING.

SATURDAY, January 21, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

Samuel J. Trepess, of Brookline, was proposed by Arthur W. Blake, as a member of the Society. Mrs. R. Josephine Cobb, of Attleborough, was proposed by Joseph H. Woodford, as an Annual Member of the Society.

Adjourned to Saturday, January 28.

MEETING FOR DISCUSSION.

LANDSCAPE GARDENING.

BY WARREN H. MANNING, Brookline.

Landscape Gardening, Landscape Architecture, or Landscape Engineering, are terms which are employed to represent a profession concerning which very little is understood by the majority of people.

Many have the impression that the landscape gardener's work only begins when the house is completed,—that it consists merely of grading, sodding, seeding, and planting. As a result of this popular ignorance there are many nurserymen, florists, and contractors who make this kind of work a part of their business, and who add to their business announcements one of the above titles, usually that of Landscape Gardener. This branch of the plant dealer's business gives an opportunity to use plants that may not at the time be in demand and of which they may have a surplus. It is in general their practice to give about the same treatment to all places, irrespective of characters or surroundings; to remove all natural rocks or bushes, grade to a smooth surface, sod or seed, and then plant throughout the open spaces and along the walks and borders the common, usually exotic, plants, with an assortment of the horticultural forms that happen at the time to be in fashion and are easily and cheaply procured in the nurseries. Their attempts to go beyond the ordinary practice too often result in such offences to good taste as a rockery in the center of a fine bit of

lawn, which, as usually made, is and always must be a bare and ugly pile of rocks; or a discarded iron kettle in which nothing creditable can be grown, placed on a rustic tripod and the whole arrangement painted bright red; or useless walks and roads with unmeaning and unnecessary crooks.

There is an impression abroad — with many, a conviction — that there is a higher practice as a profession, by which finer and more original and artistic results are secured, but with this impression is the feeling that this practice is only within the reach of cities or wealthy individuals, and is so far beyond the means of small property owners that it is not worth their time to look into it. This is a wrong impression, for even the smallest place is worthy the attention of the landscape architect, and there is as much reason for securing his services in the selection, arrangement, and construction of the grounds as there is in the employment of an architect for the buildings. A properly equipped landscape architect would be able to secure a much better result in every way, for the same expenditure of money that is required to lay out and complete the first planting of the place in an ordinary way. This higher practice of the profession should usually begin with the selection of the property on which a home is to be established, for the landscape architect in consultation with his client can often detect advantages and disadvantages that would be entirely overlooked by the ordinary observer, and, knowing the tastes and requirements of his client, can determine the amount of land necessary to carry out these requirements properly and thus often save a heavy expense in the purchase of additional land, found to be necessary after the first purchases are made, at a much increased cost over that first secured. The pieces of land in most towns with the greatest possibilities for the making of an original, interesting, and often unique place are very likely the ones longest neglected and least sought for, because their picturesque natural features or irregular surfaces will not lend themselves readily to the smoothing-out process which most land undergoes, or to square lots as laid out by the real estate agent with the assistance of the land surveyor.

I have in mind an old worked-out limestone quarry, in a dense wood, which is overgrown with ferns, vines, and bushes, and near it a summit commanding a fine view, with an open field sloping away from it. In another place a ridge of great angular

fragments of rocks, which is shaded and carpeted by pines; near by, a pleasant slope, at the base of which is one of the finest white oaks I know. At another place a beautiful undulating surface, with splendid white oaks and chestnuts, and at one side a bit of meadow with a pool, surrounded by masses of bayberry, blueberry, azalea, rhodora, and all the pretty plants and flowers that go with them. At another place there is a beautiful tree-fringed meadow,—a perfect little park in itself. All these are within less than a mile of railroad stations and with low valuations.

We may hope to see the time when such lots will be fully appreciated and such trees preserved,—not destroyed, as I know one splendid elm to have been, because to go around it a slight curve in a walk to the front door of a cheap house would be necessary.

In the selection of land, healthfulness should be one of the first considerations. It should be well drained land or that which can be well drained—preferably a porous, sandy, or gravelly soil. This applies particularly to the land where the house is to stand, for nothing can be more unhealthful and disagreeable than a damp cellar, and when the condition is such that it becomes necessary to moor a raft to the cellar stairs to be used on occasions when one has to go fishing for coal and potatoes, it is not only unhealthful, but ruinous to one's disposition. Good sanitary conditions in the neighborhood are as important as good drainage. If it is thickly settled, the ground may be saturated from leaking cesspools. Rubbish heaps, barn-yards, sink-drains, and vaults should be investigated and the purity of the water supply should be looked into. A pleasing outlook from the grounds is a very desirable feature; if not a landscape it may be a fine tree or a tree-arched street, or a bit of your neighbor's well-kept grounds. The topography of the land is also to be considered. A steep slope toward or away from the road is expensive and difficult to build upon, but often very sightly and cool in summer and warm in winter, if on the right side of the hill. A gentle slope toward the road gives good surface drainage and an easy approach. A gentle slope away from the road is not bad, and if properly managed, a pleasing result may be secured with a house set below the road level. The most satisfactory result can often be obtained on an irregular piece of land, and very often the irregularities can be so utilized as to make construction more economical than on a flat piece. Ledges and bowlders often form very interesting

and valuable incidents, giving the place an individuality which it would otherwise be difficult or impossible to secure. Masses of native trees and bushes, or individuals of either; an ancient and picturesque fruit tree; a vine-covered surface, are often of the greatest value and can be utilized to give results that could not be secured in years by artificial planting.

The site being secured, the designer must become thoroughly familiar with the nature of the ground and character of the surroundings and the requirements of the client; then, if he has the genius to make his work an artistic success, he will be able to outline clearly in his mind a picture of the completed place, which is in harmony with the character of the ground and its surroundings. His conception will be as clear as that of the artist painter. With the artist it is one thing to conceive a picture and quite another to transfer it successfully to a canvas, and so it is with the landscape architect. There must be with the power of designing, a very broad practical knowledge of methods and material available to reproduce this picture, and a skill in making plans for, and in directing work, so that the proper methods may be used and the material so combined that the desired result will be secured. With all his skill the landscape architect must often wait for years to see his picture realized, while the artist may reproduce his in days.

The success of a place depends very much upon the cordial coöperation of the building architect. By working together a result may be secured which would ofttimes be impossible, if they worked independently. Much depends upon a proper fitting of the house to the grounds,—in character, outline, and elevation,—by the architect, and a proper arrangement of roads, walks, and vegetation with reference to the house, by the landscape architect. You might as well expect two artists, one a painter of buildings and the other of landscapes, to paint pictures independently of each other on different canvases and then to trim them up and fit them together successfully. Not only should the character of the ground be considered in determining the character of the house, but also the character of the surroundings. I know of a modern cottage, constructed largely of rough bowlders with dark-stained and irregular gables and projections, all covered with a growth of vines. It is standing on an avenue surrounded on all sides by stately mansions of cut stone, brick, and wood. It reminds me

of a countryman in his old clothes at a city ball. He would be a very pleasing and picturesque object on the farm among his cattle and his help — the controlling feature of the scene — but he would look out of place among dress suits, and so did this house among its neighbors.

The character of the place having been determined by the landscape architect, or with his assistance, or it may be by the owner (for the designs of many places have been made and carried out by the owners with most satisfactory results), the location of the house, arrangement of grounds, and construction is to be considered. In these matters it is useless to attempt to establish rules, for it is seldom that two places can be treated exactly alike, even if it were desirable that they should be, and there are no two families with the same requirements. General principles may be stated that can be adapted to varying circumstances. The house will be located with reference to views, exposure, the subdivision of the ground, surrounding buildings and approaches, and this can be properly determined only by a comprehensive study of all these points. A well drained location will be secured, care being taken to avoid a site over, or in the line of, springs. In a house to be occupied in winter a warm exposure for the living room is desirable, but if to be occupied only in summer the cool side of the house should be the living side.

Convenient and comfortable approaches are more important than fine views from the windows. One soon tires of a fine view, if it is secured at the expense of a daily climb up a long hill or long flight of stairs. A fine view is to be sought for and is an invaluable possession, but it will be fully as much appreciated if reserved for occasional enjoyment from a comfortable outlook above the house site, if it is not practicable to secure it from the house and at the same time secure good approaches. In any event, the question of approach will largely govern the location of the house. Too often the landscape architect is only called in to solve the problem of how to get to the house after it is built, this important matter never having been considered up to that time, and then appearing impossible. Many times a very expensive or very awkward, and always unsatisfactory makeshift, is the only way out of the difficulty. The position of the house will depend upon the use the ground is to be put to, and care must be taken that it does not encroach upon areas required for other

purposes. An example I have in mind is that of a village lot in the centre of which a house was placed. The proprietor wanted a lawn tennis court, and could have secured it at small expense if the house had been located a few feet to one side from where it was. He had to go without it, as other parts of the ground were required for other purposes.

The subdivisions of a small or medium sized lot, outside of the approaches and yards, would ordinarily be the lawn, a flat surface for tennis or other games, which may be a part of the lawn, the flower garden, and the vegetable garden, of which the flower garden may be a part. The lawn should be the broadest piece of unbroken surface on the place; its position and size would be governed by the shape of the lot, the amount of land necessary for other purposes, the direction of the view, and the location of approaches. Ordinarily the tennis court would be located on flat land, or land that could be made so readily; on the lawn, or near it, if a grass court; if a dirt court, screened from it by planting. The flower garden should be readily accessible from the house, out of the line of an important view. Its location and character could, and probably would, be varied to suit local circumstances more than any other subdivision of the ground. The vegetable garden would naturally take up its quarters at the back of the buildings near the stable and sheds, and its relative importance would be governed by the desires and tastes of the owner. All this applies to the village lot which is all to be used for home grounds, but the same principles would apply to the home grounds which should be reserved about the farm buildings or about the house of any large estate in the country. There should be a distinct division between this, the home ground, which would be nicely kept, and the cultivated, mowed, or grazing fields of the farm. It may be a fence or wall bordered by shrubbery, to one side of which would come the lawn and on the other the farm, or it may be a retaining or ha-ha wall with the lawn sloping from the house to it, and with planting along its borders above the wall.

Roads and walks are not in themselves objects of beauty; they are essential to secure convenient and comfortable access to the buildings and parts of the grounds. To secure the least amount of road that will serve this purpose properly, and to so arrange it that it will not be too obtrusive, or cut up the broader open spaces too much, or destroy important natural features, and

at the same time secure easy grades and graceful curves is one of the most difficult problems the landscape architect has to deal with. It is in most cases decidedly better to have the main entrance to the house on the side away from the lawn. This is contrary to the general practice. The lawn should be the quiet, restful side of the house — the homeside — and should not have an avenue or turn, and the frequent coming and going of carriages and people between it and the house. A main approach direct to the entrance of the house must be provided, and branching off from this at some distance from the house, or often entirely independent of it, there should be a secondary approach to the kitchen yards and stable. The approaches should be as direct as practicable. When it is necessary to cross the lawn, the grading can often be so managed as to hide the road from the house, and give the lawn the appearance of being unbroken. Steeper grades than a rise of one foot in fifteen should be avoided in roads, and one foot in ten in walks. The curves should be gentle and be made with an evident reason. Unnecessary curves in roads or walks are always very conspicuous. For some places a straight entrance and formal treatment is preferable to curved lines and a more natural treatment. Only such walks as are required should be provided. An approach to the house independent of the drive, and walks in the gardens and to buildings are usually all that is necessary. A walk around the lawn is often unnecessary and unsightly; in wet weather it would not be used, and in dry weather the grass is pleasanter to walk upon. Roads should be wide enough for teams to pass each other, or they should be so narrow that it is evident they cannot pass, say ten feet. Twelve feet is deceptive, fourteen feet will do, but sixteen feet is better. Three teams could not pass in eighteen feet; in twenty-one they could. The width will depend upon the arrangement of roads, the amount of passing, and the character of the passing. A fashionable family with many friends and a visiting day, will need a road wide enough for coaches to pass. If roads and walks are thoroughly constructed in the beginning, on proper grades, and the water is kept off of them, much labor and expense will be saved later in repairs.

Grading, whether the changes in the natural surface are many or few, is an important matter, especially on those parts which are not to be planted. A graceful and natural fitting of the new surfaces to the old requires some skill. A gently undulating

surface and long, gentle slopes are more natural, more pleasing, and more easily cared for than short, steep slopes. In nature, abrupt slopes with sharp angles are seldom seen in free soil which is undisturbed by heavy bodies of water. Nature's process is to gradually wear off the sharp, upper edge and fill it in at the abrupt base. The result is a curve gradually running into a reverse curve — an ogee curve as the builder would call it — and it is such a curve that should be imitated in lawn grading. A formal terrace, when used, may be defined by a wall or a terrace bank. Such a bank should be distinctly formal, with its angles sharply defined and slope flat — not a mongrel with a curved top and an angular base. Very steep and abrupt slopes are sometimes necessary. They can often be filled, and held in place, with heavy, natural bowlders, and planted to imitate, so far as possible, a similar slope in nature. It is very desirable to secure a shallow turf gutter at the base of a bank sloping toward the road to prevent the water from flowing on to the gravel surface. The water can be intercepted by occasional catch basins, and carried across the road, if it is on a sidehill, or disposed of by drains.

Where a permanently vigorous and luxuriant growth of plants or a constantly fine turf is required, deep trenching or plowing and liberal fertilizing is essential. It does not follow, however, that poor or barren land cannot be covered with a pleasing growth without this thorough preparation. The luxuriant clothing of bayberry, sweet-fern, wild rose, and other plants on the sandy and gravelly soil of the exposed seashore and also inlands is sufficient evidence of this.

Drainage and the disposal of house wastes are important matters that must be considered in the plan of a place and provided for during construction. With a satisfactory fall and outlet (for which you will sometimes have to seek permission to go through your neighbor's land) the drainage of a wet surface is not difficult to secure. A satisfactory disposal of sewage is more difficult. A leaching cesspool is the usual vehicle, a very unsafe and in many soils unsatisfactory method. A tight cesspool periodically emptied is more expensive to maintain, but safer. There are safe but somewhat complicated methods of disposal by sub-surface, or surface irrigation, which can often be used to advantage. Of course, if there is a sewer the disposal is a simple matter.

Planting, which is so often looked upon as the principal work of the landscape architect, is, as I hope I have made evident, only one of the details— a very important one, it is true, but after all only the dress and ornament of the place.

There are many thousands of species and varieties of hardy plants in common cultivation in the north-eastern United States. Of woody plants alone there are between four and five thousand species and varieties that are offered in foreign and American nursery catalogues, three-fourths of which would probably survive ordinary winters at Boston under favorable circumstances. Many of these are interesting only to the botanist, and of no value to the landscape architect, but a knowledge of all that may be of value — a very large number — will enable him to produce results and secure effects that cannot possibly be secured by a man with a more limited knowledge. While the great variety that is available gives an opportunity to produce interesting details and a much longer season of flower and more interesting winter effects, it is also a great source of danger, for it constantly offers the temptation to use too large an assortment, which will result in a mixed planting with no character or individuality, and also in the introduction of many things that are not adapted to the soil or surroundings, the failure or poor success of which will give the whole planting a shabby, patchy look. It is safer to select a few reliably vigorous varieties, having good, healthy foliage through the season — they are more apt to be natives than exotics — and let them predominate in the planting; then add to its interest, if it is in a place where it is desirable to have interesting details— that is, where it frequently comes under close observation — by using a greater variety of native, exotic, or garden forms of woody plants, or hardy perennials. A large variety in a border which is to be seen from a distance is entirely lost to the eye, or gives an undesirable, mixed, or patchy look, and adds largely to the expense. If it is made mainly of a few kinds, as we see in nature, the most effective and pleasing results can be secured. A low border plantation made up of the flowering dogwood, with a few of its red flowered variety, the panicled dogwood, clethra, and wild rose, — all natives— would give a better result than the same number of exotic varieties, or if the variety were increased many times. If it were desirable to have more interesting details, large masses of loosestrife, golden rods, asters, perennial sunflowers, and the

like, would give it without detracting from the effect of the woody plants.

The use of colored foliage in a lawn planted in a natural way seldom produces a pleasing result, though I should not say that it cannot be used. To a person of refined tastes a gaudy, yellow piece of furniture in a finely furnished and decorated room, the prevailing color of which is green, would be offensive. It would mar the enjoyment one would take in a tasteful and harmonious room, for it would be impossible for him to banish this conspicuous object from his eye or his mind. But a bit of yellow ribbon or bric-a-brac in the same room could be used to draw the eye to some particularly nice feature to which this bit of color would give life and vivacity. If the same good taste that is applied to the decoration of a room be applied to the grounds, the brilliantly colored garden forms would be used less than they are now in the lawns, and be confined more to the garden. If one prefers not to have the quiet restfulness of the lawn, and cannot appreciate the refined beauty of natural shrubs with their ever varying tints of green, their graceful outlines, their wealth of flowers, their luxuriance of foliage, but prefers to make a flower and foliage garden of all his place, very gorgeous and striking combinations of color and outline can be secured with garden forms, — more striking and showy than any we ordinarily see, for there are many interesting varieties which are little known and less used. Do not understand me to disparage a garden. I think every place should have one, and that it should be made as interesting and attractive as possible, but I do not think it a good thing to spread it all over the place. A brilliant garden is as attractive as a brilliant bit of autumn landscape, but an autumn tinted landscape throughout the season would soon make one long for something green to look upon.

In the making of fine gardens and the arrangement of decorative plants, more particularly those which are used for a summer decoration, there is room for a new profession, which even now is practised, but is not distinguished from the practice of the landscape architect. It requires a thorough knowledge of this very large class of decorative plants, with the skill and taste necessary to make brilliant, yet refined and artistic, combinations, not only harmonious in themselves but harmonizing with their surroundings. Such a profession has already been called

ornamental gardening. It is not gardening in the sense of growing of plants. To have the knowledge and skill to grow the many plants and their varieties now cultivated, and at the same time to keep up with the new introductions, will tax the resources of a very active brain; there are few that can do it. Many gardeners are skilful in arranging combinations of garden plants; perhaps some of them would be more successful at ornamental gardening or designing than at gardening. It is certain that there are landscape gardeners, and probably already ornamental gardeners, who cannot successfully grow all, and perhaps can grow only a very few, of the plants they use.

There are fashions in gardens and fashions in plants, and too often a plant is considered essential because it happens to be popular. The ornamental gardener who is working for an artistic result will not hesitate to use the commonest weed, if it furnishes just the shade, texture, or form that he requires— the common burdock perhaps, or the silver weed.

The beautiful landscape of a park will never go out of fashion, and the landscape, architect in producing such, uses plants as a painter uses his pigments in painting a picture. He paints in a broad way; the minutiæ of detail of the garden and the lawn would not only be lost to the eye but would very likely defeat the very object he is working for. With him the garden standard of value counts for little. Very common plants like the willows, cat-tails, and sedges, or even the common rhubarb, may make the foundation of a picture that will challenge the admiration of the critic and even of the multitude.

There is more or less fashion displayed in the planting of a lawn; it would be better if the vagaries of fashion were confined to the garden, and that the lawn should partake more of the character of a bit of landscape, or a grassy glade, or opening in the midst of shrubbery or wood, for it is not always that the breadth of view, which makes up a landscape, can be secured in or across a lawn. It should have a beautiful fringing of green, varying in texture, color, and outline, with a frequent glow and constant sparkle of flowers, with groups and fine individuals breaking out from the bordering masses, but not interrupting the open centre of the lawn, excepting to increase the appearance of distance. You would expect to use a larger assortment in the lawn than in a distant border plantation,— more exotics and more of the garden

varieties having variations in flower,— but certain reliable varieties should predominate and establish a character for the planting which will be in keeping with the character of the place. The position of groups on the lawn will be governed by the views and by the topography of the ground. In general, elevations will be planted high and depressions low, or not at all, to increase their apparent height or depth. The planting would be arranged so that a slope would be away from it rather than toward it. A border plantation having an irregular edge with points and depressions, gives more opportunity for variety and more effects of light and shade than a straight edge. Groups and individuals would in general be used to increase the prominence of the points— not to fill up the bays. In selecting plants, the greatest care must be taken not to select too large growing kinds for the places they are to occupy. A border plantation should be an irregular mass of foliage rather than a series of distinct individuals. To produce such an effect, thick planting is usually best, for a quicker result is secured; also a more natural and graceful outline, and less care and cultivation are required. The plants will thin themselves naturally, but it is, of course, better to do a little thinning and training every year to encourage the development of interesting details, but it should be done with a definite object in view. Unless this can be done in an intelligent manner under the close direction of some one who comprehends and is in sympathy with the design, it would be safer not to have it done at all. There is no good reason for trimming shrubs, as it is ordinarily done. Surely nothing could be more ugly than the broom-headed shrubbery which is seen on many lawns, both public and private. A decoration of fagot street brooms would be about as handsome as much of it. It is neither natural nor formal. If a place is adapted to a formal treatment, and is so treated, the selection of plants to be trimmed formally would not include an indiscriminate assortment of garden shrubs, but would be made up only of those that were adapted to this treatment. Too often men who call themselves gardeners are responsible for the almost universal mutilation and misplacing of shrubs, and I believe I am safe in saying that many who are gardeners are often guilty. It would seem that the gardener's training is directed toward making successful growers of greenhouse and garden flowers and vegetables, and that there is seldom acquired anything more than a

very superficial knowledge of the commonest hardy woody plants and their treatment.

If the ground has been thoroughly prepared in the beginning and a good top-dressing is given every winter, but little further cultivation will be required after the plants have become established and have grown sufficiently to cover the ground. There is no more occasion to tear up the surface, and with it the surface roots every spring with spade or fork, than there would be to tear up the surface of a beautiful roadside thicket to keep it in good condition.

Shrubs and small trees should predominate in a small place. That very large trees cannot be used to advantage should be evident to any one giving thought to the subject, yet you will see in the majority of places large growing deciduous and evergreen trees placed so near the walks or buildings that they will in a very few years become obstructions. Broad-leafed evergreens, while more expensive, are as a rule better and more permanent for a winter effect on a small place than coniferous trees. The best plants are those which are nursery grown. Wild plants of certain varieties, if properly handled, will transplant well, and produce a good effect, but without experience in handling such plants the result is likely to be unsatisfactory. It is very difficult to get native plants of many kinds in large quantities from the nurseries, and it is in this that the landscape architect can often help to good advantage, as it is usually part of his practice to keep informed as to where such plants can be obtained.

The employment of a trained gardener on a small or medium sized place is not practicable. Men offering themselves as gardeners at day laborers' wages are more likely to bring discredit than credit to a profession that requires for success, intelligence, enthusiasm, and a true love of the work. A good gardener loves his flowers and plants next to his family, and is as impatient of neglect and bad treatment of the one as of the other. Such a man soon finds and stays in a good position with fair pay,—not as much as his skill and intelligence deserve perhaps, but in many ways preferable to other work where more dollars per day are earned. I believe it is safe to say that the majority of those who call themselves gardeners, who are drifting about and ready to accept a position at any price, are not safe men to have on a place. Their assurance is in proportion to their ignorance, and

by taking advantage of the ignorance of their employers they can do more damage to a place than the proprietor himself could, however ignorant of gardening. For this reason I believe it is safer for him to employ a willing and industrious man who lays no claim to a knowledge of gardening, but who will do as he is told, and give him directions how to do the work on the place. If errors are then made, they will only serve to increase the knowledge and interest of the proprietor.

In this writing I have had in view small or medium sized home places especially. I have hardly touched on the service the landscape architect may be to the real estate owner in planning his property to avoid steep grades and heavy cuts and fills, in preserving and developing the natural features of the place, in so arranging the lots that each may be accessible and have as nearly equal advantages as possible, and in planting to utilize the material on the grounds; to the village, town, or city in designing public recreation grounds and the surroundings of public buildings, advising with regard to street tree planting or roadside improvement; to cemeteries in designing the grounds and their decorations; to public amusement resorts in providing a convenient and pleasing arrangement of buildings and grounds, laid out in a manner to educate rather than to degrade public taste.

Some information as to the methods employed by the landscape architect, or landscape gardener, in carrying on his profession may be of service to those who contemplate employing such assistance. Some make a charge for their plan, a profit on the men employed in superintendence, and also a profit on the plants used, which they supply partly from nurseries of their own and partly by purchasing from other nurseries. There are others whose practice is the same, except that they have no nursery of their own or no personal interest in one. Others prepare plans and superintend the construction for a percentage of the cost, and still others contract for a specified sum to design, furnish all material, and construct a place. Where it is taken up as a profession purely, the practice is to make a charge for general design and report also for working drawings, estimates of cost and superintendence. Such charges are usually based on the difficulty of the undertaking rather than on the cost. On any purchases of materials that are made it is the practice to give the client the benefit of the lowest rates which frequent and often large purchases enable the landscape architect to procure.

Where a trained landscape architect is not available and the proprietor or any of his family has not the time or disposition to study into and direct the work, then the safest course would be to trust to your local florist, nurseryman, or contractor, securing from him an estimate of the cost in advance. You can hardly expect to get very artistic or original results, for the greater part of their time and thought must be given to the successful conduct of their business, of which this forms only a small department. It is very often to the local florist, nurseryman, or contractor that the landscape architect looks for his skilled assistance in carrying out the details on a place, under the direction of his trained assistants who are familiar with the plans and the results desired.

I believe the time is not far distant when the man who is to build a new place, or remodel an old one, and who wishes to secure the best and most economical result, will call in the landscape architect to help him plan the ground, as he now calls in the building architect to help him plan the building.

Discussion.

Edward L. Beard said he would like to add a word or two from his own observation, and he thought the last sentence of the paper just read would be an appropriate text. He believed most emphatically that the time has come when the landscape architect should be depended upon quite as much as, if not more than, the the building architect, in the creation of a home. The laying out and preparation of one's grounds requires the same care as the planning and decoration of the house. Twenty years ago it was different. Then the cost of the house was the only thing considered, and if any trees were introduced they were selected with little judgment and were planted promiscuously without any reference to forming a picture, or to improving the appearance of the house. Some time ago, when at Baltimore, he noticed an estate of about four hundred acres upon which stood a mansion, which probably cost at least seventy thousand dollars. But the house stood alone, with nothing done to the bare grounds to render the place attractive. Today we do not see these defects as much as formerly; taste is growing,—more, he thought in the Eastern States, perhaps, than in some other parts of the country. The work of the landscape architect is becoming more important; more thought and attention are given to the improvement of

homes. He was greatly impressed with the possibilities which the more general employment of professionals would develop. But meanwhile, when owners undertake improvements in this direction, let them look to what the ultimate result of their planting will be, when the trees and shrubs have attained their growth. There is no more valuable ally to the advancement of public taste than the landscape architect, and it is better for the owner of a place, in having it improved, to spend a little more money and have the work well done, than to have the grounds planted promiscuously.

President Kidder said we sometimes see exhibitions of singular taste in efforts at lawn decoration. As an instance he mentioned seeing a whole kitchen outfit, consisting of a range with its furniture, including pots, kettles, saucepans, etc., all in position as in use; and a plant, or collection of plants, growing in each, set out upon the lawn as a grand decoration.

Leverett M. Chase spoke of landscape gardening especially in connection with new public buildings. When such an edifice is needed, it is often the case that areas of land which may be selected as eligible for the purpose will be bonded at once by speculators, in order to secure a large profit from its sale to the public agents. By a give-and-take arrangement among themselves — and possibly a similar understanding with officials — the locality is selected where the structure can be erected. It may be a costly and showy one, but the beauty of its contour and embellishments cannot be seen, as in the selection of the ground no attention was paid to securing broad approaches, or space for lawns, or even a gravelled or paved yard. The exceptions to this rule are comparatively rare. What we need to do is to educate the people in landscape taste, not only by having elegant and costly public buildings, but by locating them in open places, surrounded by ample and tastefully arranged public grounds. Toronto, in Canada, is an instance where this principle is adopted to a larger extent than in most of the cities in the United States. With us, in nine cases out of ten, trees are not properly located; nineteen out of every twenty trees are set so near together that by their growth they soon crowd each other, and the beauty of the park or thoroughfare is destroyed.

William C. Strong expressed the great interest he felt in the subject, and said he had highly enjoyed the treatment of it by the essayist today. He believed the time is soon coming when we

shall rely mostly on the landscape architect to plan our grounds and locate our houses and other buildings, and that, too, upon small places at relatively moderate prices. There have been hitherto comparatively few — except rather large estates, or public grounds — that have been planned and arranged under the direction of professional landscape architects. The impression widely prevails that all such service is an expensive luxury in which but few can indulge. He thought it would be a great service to the public, if some of these professional men would aim to popularize their calling by brief suggestive work, applied to small places at moderate cost, leaving the labor to ordinary workmen. The advantage of employing such skilled judgment at the start, if not too expensive, would be manifest to all. He agreed with the lecturer, that in planting we should generally avoid fancy colors; also that it is very easy to be tempted to use too great variety. Nature made no mistake in providing green as the prevailing color. Still there are many exquisite shades of green, which can be combined in various ways, producing beautiful effects, none of which will be gaudy. The silvery sheen of some of the Conifers, the brilliant shades of the Japan Maples, and many other distinct colors, all have their advantages in producing the best results.

Thomas C. Thurlow thought that most books or treatises on landscape gardening are better adapted for the use of those owning extensive grounds, with abundant means, than to those with small grounds and limited means. In our manufacturing towns and villages, there are being erected every year, hundreds of houses — mostly, perhaps, built on lots of fifty by one hundred feet — and the general view appears to be that the nearer level the land is, the better. Further than that the owners do not pay the least regard to the land, or the future use to be made of it. The one idea appears to be to get the house up and ready to occupy in the shortest possible time. The sand and gravel from the cellar is often thrown out, completely covering all top soil, which should have been carefully saved, together with that from the driveway and paths. This top soil, with other loam, should be used to finish grading up around the house, in a natural easy curve, and to the depth of from one to two feet; and also upon the small plat to be used for a lawn, or for growing trees and flowers. Instead of this, however, the sand and gravel only are often used for grading up about the buildings, and other equally

worthless material is hauled in to "fill up" any inequalites on the proposed lawn and garden.

The speaker used, as an illustration, Haverhill — near which is his home — now a city of thirty thousand people, but which within his memory was known in that vicinity as Haverhill Village. There were over two hundred and fifty houses built there during the past season, many of them of considerable pretension, planned by competent architects, and generally painted in the most approved modern style. And yet it is doubtful whether any one of their projectors ever consulted a landscape gardener. If a couple of hours' advice costing about ten dollars, or a simple plan of the grounds, for twenty-five dollars, could have been obtained from a competent person, many, no doubt, would have availed themselves of the privilege. But no such person was to be found. The landscape architects of our day do not apparently care for these small jobs.

Formerly, when shade trees were needed for the streets of this town, some New Hampshire farmer was engaged to dig maples and elms from his pasture or woodland, and the usual price of one dollar each was paid for tree and planting — the planting oftentimes done much the same as you would set a telegraph pole or hitching post — and if the "Committee" were sharp enough to get such work done for fifty or seventy-five cents per tree, it was considered a "smart" transaction. The speaker suggested that it might be a good plan for this Society to offer a premium for the best small treatise upon the A B C of landscape gardening and landscape architecture, and thus promote the knowledge — and the more general application — of this beautiful art.

O. B. Hadwen had been much interested in the subject of the essay, and considered that its treatment was in the right direction. He had known for some time the importance of this subject, and especially in its application to farms, a point upon which he noticed the lecturer had not touched. The most of the land in this State is occupied as farms; but farmers, as a rule know little or nothing of landscape beauty. They are taught to cut down trees, but not to plant them, nor to reserve and protect them. Hence our farm scenery has suffered generally, and has rarely been improved by the owners. He said it did him good to see the large stately trees that have been left standing by some sagacious men, when cutting off a crop of wood; also well

developed trees that have been planted for ornament long years since. He also admired the beauty of some recently introduced trees such as Schwedler's and Reitenbach's Norway maples, with their rich colors, changing from spring through the summer and to the end of autumn; also coniferous trees which are darker colored above and lighter beneath; or with blue, or sage colored foliage, like *Picea pungens*, the peculiar color of which is due to cultivation. Manuring changes the color of *Pinus pungens;* and having learned this fact, the farmer must see to it that his trees are highly manured to develop their beauty.

The Chairman of the Committee on Discussion announced that on the next Saturday, "A Historical Sketch of English Horticulture" would be given by Samuel Henshaw, of West New Brighton, Staten Island, N. Y.

BUSINESS MEETING.

SATURDAY, January 28, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

The Secretary moved that the Finance Committee be added to the Executive Committee for the consideration of that part of the President's Address relating to the Building and the Library. The motion was unanimously carried.

Adjourned to Saturday, February 4.

MEETING FOR DISCUSSION.

HISTORICAL SKETCH OF ENGLISH HORTICULTURE.

BY SAMUEL HENSHAW, West New Brighton, Staten Island, N. Y.

The subject given to me by your Society is one to which justice cannot be done in one short essay, but which would require a series of papers, or even a volume to give an intelligent outline of what has been done in our profession, even in the last two centuries. But, as I interpret it, the subject calls for a historical retrospect,

and a comparison of what it is today, with horticulture in the most remote period of English History. Consequently, I am compelled to begin at the beginning, and take a glance at the records we have of anything pertaining to horticulture in the British Islands from the earliest periods.

We are entirely in the dark regarding the cultivation of either fruits or flowers previous to the Roman occupation of England. There are some vague hints by the early historians of the cultivation of certain vegetables and fruits by the aboriginal inhabitants, but nothing that we can place any reliance on until about the year 80, when Julius Agricola invaded England, although one writer says the grape vine was introduced about the year 10 of our era. However, we do know that when once the Romans had obtained a footing on those Islands it was not long before they introduced and taught the cultivation of all the known desirable fruits and vegetables of that period, especially as many of the fruits and vegetables grew to greater perfection in the climate of England than they could possibly be made to do in Italy. The currant, gooseberry, raspberry, and strawberry are natives of Britain. From the evidence we have that the rich Roman families were in the habit of spending their summers in England, to escape the heated term of their native clime, it is but natural that they would be anxious to surround themselves there, with all that contributed to their comfort and enjoyment, both socially and otherwise. We have abundant evidence, from recent discoveries made in various parts of England, that the "four hundred" of that period, selected some of the most favored parts of the Island for the gratification of their luxurious and refined tastes. There may still be seen the remains of their villa residences at Bath, Chester, Cheltenham, and various other places, where there were either mineral springs, mountain air, or the social life incident to the security afforded by a walled city, which meant "a colony of summer visitors," and all which that expression means today in a similar gathering of our own times. When one examines the elaborate and ornate decorations that have been lately exhumed at Bath, Chester, and other summer resorts of the wealthy Romans in England; the mosaic pavements leading to their baths, the partly covered courts, and other provision made for the thorough enjoyment of a summer retreat, it appears improbable that a colony of such rich and aristocratic people would be willing to

forego, even for a brief period, all the accessories of a luxurious life, to which they were so accustomed in their winter homes that they had become necessities to them.

The recent discoveries at Herculaneum and Pompeii reveal to us the people who made up the transitory population of the fashionable resorts of those times, for, as far as any comparison has been made, the architecture, decorations, and general design were very similar, subject of course to the modifications required by the difference of climate.

Again, they were contemporary, and living under the same government; having abundance of wealth to gratify all their luxurious tastes; having for slaves a conquered people to do their bidding; with all the southern and middle portion of the Island held as a colonial part of the Roman Empire for a period of four hundred years, so that there was ample time to introduce and acclimatize any of the fruits, flowers, and vegetables they might desire for their own use, and to exchange for the produce of other climes. We may take it for granted that the apple, pear, cherry, plum, and many of the native small fruits would be grown and improved by them. We know little about the flowers of that period, but the paintings on their walls, to be seen in many of the once buried cities, represent palms and other plants as household decorations; jars of preserved fruits, and other evidence of a highly civilized people, tell us that this branch of horticulture was not neglected by them.

The abandonment of England as a Roman Colony, necessarily brought about a state of things unfavorable to the progress of horticulture. History is almost silent on this subject for a long period, but we have abundant evidence that the work begun by the Romans was not entirely lost sight of or abandoned. Neither did all the colonists accustomed to the culture and improvement of the various fruits and flowers, leave England when their rulers did; but some continued their residence and the cultivation of vegetables, fruits, and flowers for their own use and profit.

The Saxon period was an improvement on the preceding two or three centuries, and we begin to have some little record of what was being done in the line of horticulture. Some of the early traditions of the time speak of some of the old-fashioned flowers, and the use made of them; for instance rosemary was carried by the mourners at the funerals of their friends, and that custom is

still kept up in many parts of England. Herbs of various kinds were used to flavor different dishes, and honey was made into a fermented drink called mead, indicating that bees were kept and cared for at that period.

But the Doomsday Book brings us face to face with facts that show plainly the taste and thrift of the common people of England in the eleventh century. In it is a record of all the homesteads in the country at the time of the Norman invasion; how many cattle they owned, and their value; what crops they grew, and a minute outline of the daily life of the people at that period. In the unsettled times following, and for several centuries, the pursuit of horticulture was mainly followed by the inmates of the various religious houses, and the gardens of the monasteries and abbeys were resorted to, both for pleasure and profit, for besides growing the various fruits, vegetables, and herbs for their own use, the country people in the immediate neighborhood came in for a share of the good things, which were freely given if asked for. The old gardens attached to these abbeys may still be seen in various parts of England. Among those I have seen I will mention Tintern Abbey, Furness Abbey, Kenilworth Abbey, Fountains Abbey, and Glastonbury Abbey, and there were many others. Historians of that period tell us that the monks of Glastonbury made their own wine, cider, and perry, clearly indicating that the grape, apple, pear, and other fruits were largely grown.

The early poets such as Chaucer, Spenser, and others give us many glimpses of the various flowers and fruits in their season at that time. Shakespeare makes frequent mention in his plays of the different flowers and fruits of his time.

The old laws of primogeniture, however objectionable they may have been politically and socially, have been of great benefit to the horticultural world, for they have been the means of preserving to us intact some of the best examples of horticulture to be found in the world today; and where the owners of those old estates had any taste for improving them, the heirs would continue to embellish and beautify the ancestral homes. They now often show samples of the present styles of gardening side by side with those in vogue centuries ago. In some of these quaint old "Grandmothers' Gardens" may still be found the flowers and fruits that were prized for their perfume, their old associations, and their value as medicines. Sweet herbs always occupy a prominent

place in these gardens, for, in many of the old homes, the grandmother with her stock of dried herbs, and a knowledge of their virtues, was often the only doctor thought of. Some of us have a lively recollection of the bitter and pungent doses these old ladies could compound from these same innocent looking herbs. Gerard's "Herbal," published in 1597, is in a great measure responsible for those old-time doses.

The old gardens at Berkley Castle — said to be the oldest inhabited house in England — are well worth a visit. They are kept much in the same style as they were in the fifteenth century. Yew and box are still cut and trimmed into the most quaint and grotesque shapes imaginable, and the sun dial occupies a prominent position. There were plenty of York and Lancaster roses, eglantine, lavender, rosemary, and other sweet-scented shrubs of great age, and single hollyhocks, wallflowers and clove pinks in abundance. Haddon Hall, in Derbyshire, is another old place, with a garden planted in the style fashionable during Queen Elizabeth's reign. The gardens around the Bishop's palace in Wells, are even more quaint, for the whole of the grounds is surrounded by a moat filled with water, with portcullis and drawbridge. The lawn in this garden is one of the oldest in England, and has not been disturbed for centuries, yet the grass feels and looks like velvet.

Horticulture does not appear to have made much progress during the Wars of the Roses and the Commonwealth. But after the country again settled down, and England began to colonize her foreign possessions, a great impetus was given to all branches of horticulture.

Lord Clive had conquered India, and for doing so received a severe reprimand from the British Government; but England has held on to it for all that, and today considers India one of her most valuable possessions. That country has yielded many treasures to horticulture.

The American colonies, founded originally for commercial purposes, gave fresh zest to the discovery and cultivation of many plants entirely new to the Old World. Nothing was known, previous to that time, of the potato, tobacco, maize, and Lima beans. Among flowers it was the home of the dahlia, poinsettia, verbena, and many other plants only found on the Western Continent. The establishment of Kew Gardens formed a nucleus and

a home for the development and propagation of anything new in the way of plants from any part of the world, and from this source some of the best and most useful products of nature have had their starting point under cultivation, and by that means have been disseminated to private places in England, and to the trade in general.

The sending out of collectors to unexplored regions, both by the government and private individuals, has added largely to the list of useful and ornamental plants. Amongst some of the most distinguished and practical men of the last century who have been the means of adding to the list of new plants are Sir Joseph Banks and Dr. Solander (who accompanied Captain Cook in his voyage around the world), Bartram, Siebold, Humboldt, Linnæus, and Parkinson.

Another great help to the dissemination of a knowledge of horticulture was the publishing of various works on the subject, and up to the middle of this century the writings of such authors as Abercrombie, Sweet, Evelyn, Parkinson, Kent, Lord Bacon, and other contemporary authorities were largely copied. Some of their directions for the culture of fruits and flowers were quaint and minute, intermixed with much solid sense and close observation. One of these old writers advises that manure should be used with great caution, as it might have a tendency to impart a disagreeable flavor to the crops. Others give very particular instructions about sowing and planting at the time of a growing moon, warning their readers that the result would be much better than if sown at the time of the waning moon.

The London Horticultural Society, with its exhibitions, experimental grounds, and its published "Transactions," has been a great help in bringing before the public anything new, and the awarding of certificates of merit to those enthusiasts who were fortunate enough to raise and bring to its notice any improved form of fruit, flower, or vegetable, has assisted in this work.

The establishment of an Experimental Garden at Chiswick, also gave new and valuable aid, particularly to fruit growing, for if any doubt was raised about the merit or other characteristic of any new introduction, it could at once be decided by comparison with the growing plants. This experimental garden has also been the headquarters for establishing and maintaining a correct nomenclature of all the fruits worthy of cultivation; and when in charge of Robert Thompson was looked upon as an infallible authority.

The common people of Britain, from time immemorial, have taken a great interest in everything that added to the beauty and comfort of their homes; the old saying that "an Englishman's house is his castle" has proved to be true, time and again in history. The fondness of the people for detached homes, surrounded or approached by a garden, seems inborn, for when compelled to live in towns where a garden is impossible, tracts of land in the immediate suburbs are rented and divided up into separate gardens. Often there is no fence between the different owners, but a mutual interest serves to keep off all intruders.

A spirit of rivalry exists among them as to who can raise the best crops, and when a cottager takes any particular fruit, flower, or vegetable in hand as a hobby, he is bound to show something creditable, even when cultivating it under the most adverse circumstances. This spirit of emulation is kept up, in a great measure, by the almost universal practice of holding periodical shows in all parts of the country. At these cottagers' shows may be seen the products of their little gardens, brought together for competition. Some of the more enthusiastic growers will travel many miles previous to the time of holding their own show, just to keep posted on what their rivals are doing, and to learn how the pet specimens of others compare with their own products.

The Lancashire Gooseberry Growers' shows are known all over the country, and the amount of time, labor, and enthusiasm the growers are willing to bestow on their favorite sorts is astonishing. Then they are constantly trying to raise new varieties from seeds of an unusually fine berry. These are watched like babies until they come into bearing, and if one shows any superiority over any of the old sorts in its class, great secrecy is practised to keep it from the eyes of rival growers. When the fruit intended for exhibition is approaching ripeness, there is great anxiety felt, for too much moisture is liable to burst the fruit and disqualify it for exhibition purposes. The first prizes were usually a copper kettle or a silver tea-pot, and when a boy I knew a boat builder, who had won so many that the ceiling of his living room was hung full of these trophies, each engraved with the name of the fruit, and when and where won. It was remarkable that some of the most successful growers were those who followed an entirely different calling for their daily bread — weavers, colliers, carpenters, and men of other trades, all had their favorite fruit or flower. Tulips were

much grown, but always of the late or show kinds. Such kinds as Greigi, Gesneriana, Parrot, or any of the double forms were not grown for prize-taking. Each grower had his own seedlings coming along, and when we remember that it takes seven years to fix the colors in a seedling tulip, we can see that there was a large stock of patience required to await the result. Carnations, picotees, auriculas, pansies, wallflowers, and many other old-fashioned flowers, seldom seen now, were grown, and many of the improved forms of these flowers seen today owe their development to these amateur growers. Many of these cottagers' exhibits were equal if not superior to any that a professional gardener produced. On a recent visit to England, I saw in the markets of Manchester, Bristol, Bath, and other places, some of the finest samples of cucumbers, mushrooms, rhubarb, grapes, and apples, as well as flowers, that were grown in these cottage gardens and their small greenhouses and frames.

I cannot close this paper without saying something about the old gardeners and the part they took in the development of horticulture in England. At the end of the last century, and up to the early part of this century the men in charge of some of the finest places in England were comparatively isolated from the rest of the world. The estates were far apart; travel at that time was slow and difficult; consequently, they were left in a great measure dependent on their own resources. This, however, gave them an opportunity to stamp their own individuality on some of the features of the estates in their care. Many of the best samples of gardening today are the work of these men. In many cases they were landscape gardener, practical gardener, and steward combined. They felt a personal interest in the improvement and good name of the estate, many of them holding their positions for a lifetime, and their sons following in their footsteps. It is not to be wondered at that much interest would be taken in the growing and development of anything they took a particular fancy to, or in carrying out any improvements suggested by their employers. I might here mention a few of the estates that have been so improved, and brought to their present high state of perfection by a long and intelligent treatment at the hands of practical gardeners. Chatsworth, the seat of the Duke of Devonshire, where the *Victoria regia* first flowered in England, and where the first greenhouse was built for the growing of aquatics;

also famous as one of the most complete and finished private places in England, was for a long time in charge of Sir Joseph Paxton, and later of a man you all knew, the late James Taplin. Another noted place is Shrubland Park, the seat of Lord Middleton, where many of the present race of geraniums, and other bedding plants had their origin. Their introduction we owe to the intelligent hybridization and selection of the late Donald Beaton; amongst some of the sorts that made quite a stir at the time were Stella, Shrubland Pet, and many of the nosegay kinds.

Blenheim, the seat of the Duke of Marlborough, is a place of national reputation, and one of the best examples of landscape gardening as practised by Humphrey Repton. Here he carried out his conception of what can be done with water in this art. There is on this estate, the largest artificial lake I have ever seen. Trentham, the seat of the Duke of Sutherland, is another well-known show place, famous for the successful forcing of all kinds of fruits, together with extensive ornamental grounds.

At Ashton Court, the home of Sir Philip Smythe, I have seen finer samples of American plants than anywhere else in England. There are on this estate, plants of *Yucca gloriosa* so old that no one living on the place now, knows when they were planted. They are larger than any I have seen in either Florida, Georgia, or any other of the Southern States, and have never been protected; but they are propped up like a lot of cripples, to prevent their being broken down by their own weight. Here may also be seen fine specimens of live oaks, magnolias, and many other plants too tender to survive the winters in other parts of England; also examples of the different styles of flower garden planting in vogue two hundred years ago, and also a terrace wall with its decorations of urns and pilasters designed by Inigo Jones. At Styal, the seat of the Gregg family, may be seen all the varieties of the Rhododendron family worth growing. The successive generations of the same family have been enthusiastic in hybridizing these interesting plants, and here they find a congenial home, for they are planted in the woods, and along a ravine on the banks of the River Bollin, giving them a much more natural and pleasing effect than any artificial beds could do.

Worsley Hall, the seat of the Duke of Bridgewater, was famous for its pineapples in olden times, and is now noted for its fine collection of fruits. Here also may be seen the "Old Hall,"

where the "Father of Inland Navigation" lived. The old building is carefully kept in the quaint black and white style in vogue many centuries ago. I have heard my grandfather say that when the old duke had made a success of his canals he spent a great deal of his time in the old garden; that he was partial to the old clove carnations; that he was an inveterate snuff-taker, and in order to facilitate taking it in sufficient quantity, he had it poured into his waistcoat pocket without a box, and that he invariably took a good pinch of snuff before smelling of his pinks. The boys in the garden wondered which he smelled most, the pinks or the snuff.

At Studley Park, the seat of the Earl De Gray, nature has done a great deal for the beauty of the place, but it has also been improved from time to time by a long line of owners who have taken up and carried out the line of improvements started by their forefathers. It has also been in the hands of many of the best practical gardeners at different periods.

Many other private places might be mentioned in the British Islands where gardening is carried on to great perfection, but time will not permit enumerating them at present.

Another impetus has been given to the love of horticulture in England by the setting apart of sufficient space in or around the different towns for Public Parks. Many of these are in the midst of densely populated and smoky districts, and, as may be imagined, the satisfactory growing of flowers in such surroundings is almost impossible. But the men in charge are intelligent and enthusiastic, making very creditable displays with a very limited number of varieties of plants that will endure a smoky atmosphere. Amongst a number of parks with these unfavorable surroundings may be mentioned Stamford Park, at Ashton, near Manchester, in charge of George Lunt, who had the finest display of tulips, hyacinths, and other spring bulbs and herbaceous plants, that I have ever seen. These were followed by such bedding plants as he had found from experience would grow in such a forbidding locality. Rhododendrons and some other American plants were planted, but the beauty of their foliage was spoiled by the quantity of soot with which it was covered.

The Manchester Botanical Gardens have for a long time been presided over by my old friend, Bruce Findlay. Here have been held some of the best shows in England, and the gardens are

open to the public during the holiday season, which is "Whit Week." The prize-takers at these shows have been most of the famous horticulturists of the present century, for the liberal prizes offered brought together all the most famous collections of plants, fruits, and vegetables, and their growers.

Another great public educator, in connection with these gardens, is the space always given to the "cottagers' exhibits." These are gathered from all the surrounding country, and form one of the most interesting parts of the exhibitions.

I could make a very long list of the frequent prize-takers at these exhibitions,—men who have been in the front rank, and in their line have done much to make the many improvements in the fruits, flowers, and vegetables of today. But, as I said at the commencement of this paper, a volume might be written of the improvements that have been made since the middle of this century, but this paper I am afraid is already too long. At some future time I might say something of the noted men of our own times, who have done so much to bring about the present state of perfection we find in English horticulture.

In closing this paper, let me mention another public educator, and that is, the marked improvement in the literature connected with our profession. We all remember the monstrosities that were formerly made to represent the different fruits and flowers in the catalogues, and even the magazines of a few years ago, and the very unreliable, wordy descriptions of any new fruit, flower, or vegetable. How different they are today! You can take up the catalogues of any of the prominent seedsmen or nurserymen and read them through with a great deal of interest. In many of them the illustrations are the work of some of our best artists, the literary composition is as good as that of any of the current magazines on any subject, and some of them strive to be so accurate that they employ photographers to make all their illustrations. In fact, any of them are fit adornments for a drawing-room table. All this is not brought before the public without a great deal of expense. I remember once being in the office of the late Peter Henderson, when his spring catalogues were being brought in, and I remarked that it seemed a very expensive way of telling the public what he had to sell; his reply was, that it cost him twenty thousand dollars to get them in, and ten thousand dollars more in postage, etc., to get them out again. If

any one had been so rash as to spend that amount of money in catalogue making a few years ago, he would have become bankrupt before any return would have been made on his investment.

All this goes to show that the taste for horticulture is growing; the public read more and are getting more interested in the subject every year. In fact, I believe we are only at the beginning of the capabilities of horticulture, and its refining influence on the people of England, America, or any other country.

Discussion.

William C. Strong said he experienced a lively interest in the comparisons drawn between the earliest known efforts in horticulture, in England, with those of recent times, as they were presented by the essayist. He thought the statements made contained many good suggestions which may be useful to us. It was pleasant to learn that some good things could be named as coming down to the present generation from the iniquitous system of primogeniture. It kept an estate together and tended to preserve and continue methods of culture and treatment, which certainly were advantageous. Here, on the contrary, we as a people are changeable, and few estates remain in a family after the founder passes away. He could remember a few early estates which attained distinction because of the horticultural operations that were carried on upon them. The Cushing place at Watertown — now Belmont — was once widely known by reputation. The Lyman estate at Waltham was the home of scientific agricultural and horticultural practice. These and a few others were strong supporters of this Society in its earliest efforts to promote horticultural interests in Massachusetts. But the then owners of those estates having finished their course, the estates and the work so well begun upon them have also passed away from us. It is unfortunate for our horticulture, that we have not the class of enthusiastic gardeners of whom the lecturer has spoken. But then another difference in circumstances is that most of our well-to-do occupants of estates are too much absorbed in business affairs to take such interest in the cultivation of their home grounds as is the rule in the old world. In every other direction we, as a people, are going forward with rapid strides. It would appear that the general interest in the cultivation of crops in our

country is quite strong, since the seedsmen could not afford to spend money so freely in advertising by expensive catalogues, as stated, if they had not a sure ground for the expectation of an abundant return in trade. This Society promotes the work pretty well, considering our limited room. We must enlarge our available space before we can extend our work to good advantage. Let us be on the watch to extend our influence as our opportunities may open.

Francis H. Appleton referred to the tendency here to divide large estates into many small ones, as spoken of by the essayist. This lessens the demand for plans involving large areas and more than a generation of time to carry them out. His work on the Gypsy Moth Committee of the Board of Agriculture, had called him into neighborhoods composed of many small holdings, and it is interesting to see how much can be and has been made of such; surprising results are sometimes found to be possible. Many cases exist that are object lessons for good. There are many instances where residents, by pleasant, health-giving, personal effort, might introduce new attractions and thereby secure a great deal more enjoyment of home than they now realize can be made possible. Another influence against home improvement is that, as a rule, our people are so unstable; many families change their place of residence frequently. Business so entirely occupies the attention of others as to exclude all thoughts of home culture and embellishment. As the essayist spoke of the work commenced so long ago and kept up ever since on the great English estates, it excited the thought that it behooves us to see how much can be done to improve the small places into which the land is divided in our own country.

Mr. Appleton said he had been much pleased with the essay, and had enjoyed it highly, and he moved a vote of thanks to Mr. Henshaw for his very interesting paper. The motion was unanimously carried.

Mr. Henshaw in response to the vote of thanks tendered to him for his essay, said that he at first hesitated to appear before a Boston audience, especially one whose members were more or less familiar with his subject. But he was now glad he did not yield to that prompting, and he sincerely thanked the audience for the kind attention which had been given to his paper.

O. B. Hadwen announced that the subject of the lecture on the next Saturday would be "The Progress of Horticultural Societies;" to be delivered by Hon. Henry L. Parker, President of the Worcester County Horticultural Society.

BUSINESS MEETING.

SATURDAY, February 4, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

Charles E. Richardson, Treasurer and Superintendent of the Building, read his Annual Report for the year 1892, which was accepted, adopted, and referred to the Committee on Publication.

The Secretary read a letter from Annie E. Robbins, Secretary of the Middlesex-Worcester Pomona Grange, No. 3, Patrons of Husbandry, communicating a unanimous vote of the Grange, endorsing the action of the Massachusetts Horticultural Society in its methods recommended for the extermination of caterpillars.

On motion of E. H. Hitchings, the President appointed the following Committee on Window Gardening:

Mrs. H. L. T. Wolcott, *Chairman*,

E. H. Hitchings,	Henry L. Clapp,
George E. Davenport,	George A. Parker,
Mrs. P. D. Richards,	William E. C. Rich.

On motion of William C. Strong, it was voted that a Committee of three be appointed by the Chair, to consider the arrangement of the Business Meetings and Meetings for Discussion, so that they shall not interfere with each other.

The Chair stated that he would announce the Committee at the next meeting.

On motion of Francis H. Appleton, it was voted that the same Committee consider the expediency of providing additional ballot boxes; and that they be authorized to procure not exceeding six if they deem it expedient.

The following named persons, having been recommended by the Executive Committee as members of the Society, were on ballot duly elected:

Robert Kent James, of Dorchester,
Lawrence Cotter, of Dorchester,
Amos M. Leonard, of Boston,
Samuel J. Trepess, of Brookline,
Mrs. R. Josephine Cobb, of Attleborough.

Adjourned to Saturday, February 11.

MEETING FOR DISCUSSION.

The Economics of Horticulture.

By Hon. Henry L. Parker, President of the Worcester County Horticultural Society, Worcester.

It seems to be a popular impression that the "Hortus" is a plaything of the rich; that the science of Horticulture means costly lawns and pleasure grounds, ferneries and arboretums, green-houses for exotics collected from every clime, plants and flowers to gratify a love of the beautiful, and tropical fruits which only the epicurean taste of the wealthy can afford; in short, that Horticulture is a recreation and a "fad"— a luxury for the favored few.

But there never was a greater mistake. This noble science has a utilitarian as well as an æsthetic side, and as a factor in political economy it may be doubted whether any other has played a more important part. It has been called the "handmaid of agriculture." It is more than that; it is its mentor and guide — its inspiration. It has given to agriculture new methods, and directed it into new channels. It has by constant experiment and long-continued investigation developed from a natural state and brought into general use, new species of fruits, new edible plants, new species of vegetables, and taught the best methods of their cultivation. It has collected grasses, fibrous plants, fodder plants, resin, gum, and rubber-bearing trees, grown them, tested them by exhaustive experiment, and distributed those which have proved of value to every quarter of the globe.

The increased quantities of food for man and beast produced by these means, the materials of commerce thus multiplied, and the

employment thus furnished to countless multitudes, have laid the foundation of the national prosperity of many countries.

The science of Horticulture is also the auxiliary of the other sciences. In the propagation of medicinal plants and the production of new medicinal agencies, it has proved of invaluable service to the medical profession.

Vegetable physiology has been in many respects the pioneer of animal physiology. For example, the doctrine of the cellular animal tissue originated in and was based upon botanical investigation which led to the discovery of the plant cell.

The cellular structure of plants was first pointed out and elaborated to some extent by Robert Hooke and others in the seventeenth century. In 1833, Robert Brown discovered the nucleus in plant cells. Five years later, Schleiden, the eminent German botanist, pointed out the *formation* of cells in plants, and laid the basis for the now universally accepted cell doctrine. These generalizations, which Schleiden had made with reference to plants and plant cells, were afterwards extended by Schwann, the physiologist, to animals and animal cells.

Certain drugs of vegetable origin — like morphine, strychnine, atropine, and veratrine — have become of the utmost importance, if not indispensable, in physiological investigations. It is perhaps safe to say that certain lines of physiological experimentation would not have been possible without *curare*, the celebrated South American arrow poison, from the juice of the *Strychnos toxifera*, the peculiar action of which is to completely paralyze the motor nerves.

These results in horticulture and in vegetable physiology have been obtained for the most part by the founding and support of horticultural societies, botanic gardens, and arboretums, with their adjuncts, greenhouses and forcing beds, herbariums, experimental grounds, museums, pineries, palm-houses, their schools of botany, and schools of practical gardening, their museums and laboratories, their collection, and facilities for the collection, of seeds, plants, and trees, from every clime and every nation.

And it is only at such an institution, equipped with all these accessories and appliances, that the science of Horticulture can be most profitably and diligently pursued. And such an institution, thus equipped, affords the opportunity for researches which may prove of inestimable value to mankind.

The best illustration of such an institution is the Botanic Garden at Kew, — or, speaking more correctly, the Royal Gardens of Kew, — on the banks of the Thames. These stand at the head of all similar establishments in the world. They constitute the centre around which, not only the horticultural and botanical science of England revolves, but of the whole continent as well, and, for that matter, of the whole civilized world. It is universally acknowledged to be the most complete organization of its kind in existence.

The great work of Kew, however (although Kew is one of the oldest of such institutions now in existence), has been accomplished principally within the past half century, and since it came within governmental control.

The pioneer work was done by the Horticultural Society of London, among the moving spirits of which were its first active President, Thomas Andrew Knight, F. R. S., and Dr. Lindley, Assistant Secretary, who contributed many valuable papers to its "Transactions." This institution was organized in 1804 and incorporated in 1809, and was the first society of any note, in Europe or America, to collect and classify plants and trees under the Linnæan system.

Mr. Knight, in one of his first addresses relating to the objects of the association, speaks of the then primeval condition of horticultural science. It is interesting and instructive to compare the picture he presents with the magnificent results that have since been obtained. He says:

"We possess no sources from which sufficient information can be derived to direct us in our enquiries as to how to trace out the various changes which art or accident has, in successive generations, produced in each of the vegetables which now occupy the attention of the gardener and agriculturist; and are still ignorant of the native country, and existence in a wild state, of some of the most important of our plants. We know that improved flowers and fruits are the necessary product of improved culture; yet few experiments have been made, the object of which has been new productions of this sort; and almost every ameliorated variety of fruit appears to have been the offspring of accident or of culture applied to other purposes. Societies for the improvement of domestic animals, and of agriculture in all its branches, have been established with success. Horticulture alone appears to have been neglected, and left to the common gardener, who generally pursues the dull routine of his predecessor."

This was uttered since this century began; since then the common gardener has been transformed into the accomplished botanist and man of science; while the practice of his art has blessed mankind and changed the face of nature.

In 1820 this Society began the construction and maintenance of an experimental garden at Chiswick, a few miles from London proper, also on the banks of the Thames.

From this date, for a period of twenty years, more or less, the Chiswick Gardens became — what the gardens at Kew became later — the centre of horticultural and botanical knowledge. Expeditions were organized and sent from it to the four quarters of the globe, for the collection of plants and seeds. In 1824 these gardens contained the most complete collection of fruit and hardy trees then existing in England or any other country. The work of the experimental garden (while floriculture received its due share of attention) was of a most intensely practical nature. For the carrying on of this work, the grounds were supplied with every conceivable structure and appliance necessary and needful,— tanks, cold frames, melon pits, forcing beds, an herbarium, a library, etc. Buildings were erected for the botanical and other scientific work attempted and accomplished. Annual reports, of great economic value, were prepared and published, showing the results obtained.

Among the active members and those carrying on investigations were men of the highest scientific attainments — Fellows of the Royal Society of London, Fellows of the Linnean Society — and the results of their experience and investigations were also published by the Society.

In 1840, however, Kew, which had been languishing for want of support, was subsidized by the English Government. The gardens, which before were the property of the Crown, were surrendered, and became from that date a national establishment. And as Kew went up, Chiswick went down. The eminent Sir William Jackson Hooker was appointed Director, and under his efficient management Kew advanced in usefulness and importance by leaps and bounds.

There was great difficulty, however, for many years — owing to the feeling, to which I have already alluded, that the institution was a sort of plaything for the wealthier classes — in obtaining the necessary appropriations from Parliament. And the struggles of Director Hooker for many years in obtaining these appropriations

were both interesting and amusing. Members of the House of Commons would rise in their places and enquire with great gravity and earnestness, Why this paternalism? *Cui bono?* What is all this worth? Why should the government support mere pleasure grounds for the benefit of idle loungers? All this should be left to those æsthetic individuals, gorged with riches, who like such things and have no better use for their wealth. This should be made a private affair. The Government should place its appropriations where they will do the most good and meet with a fitting return.

But as year after year went by and the beneficent work of this institution became more and more apparent, these utilitarians were silenced. They were beaten at their own game. It was demonstrated beyond cavil, that the Gardens of Kew were a paying investment, and were making large contributions to the national wealth and prosperity. They stand today upon a firm and well established basis. They have become an institution in which the nation takes great pride. They are the parents of fifty other institutions of a like character, in England and her colonies, and he would be a rash man indeed who would dare oppose any reasonable appropriation for their benefit.

The limits of this paper will not allow me to state in detail all the work this institution has accomplished in the line of economics. I can only generalize.

There is, first, the Museum of Economic Botany, established about 1847, and which occupies three buildings. Here is represented, so far as known, every useful plant and tree the world contains, with a representation, so far as possible, of the manner of its use.

From the Museum of Timber, cabinet makers, builders, architects, and furniture manufacturers gather information of great value in their respective vocations.

The Herbarium is the largest and most useful in the world. The number of specimens it contains was estimated many years ago at over one million, and more than twenty thousand are added annually.

Vegetable diseases and insect pests receive attention, and remedial agencies are provided with which to contend against them.

The distribution of seeds and living plants from Kew, has been enormous. They have been sent out to meet the demands for

government plantations in the colonies and elsewhere, such as mahogany seed sent to the East Indies and to Mauritius and the seed of the Liberian coffee, which, being of a robust habit, will thrive in hot and moist situations where the Arabian variety is unable to live. This variety was developed at Kew from seed sent there for investigation and experiment. It proved so prolific and hardy that it was sent to take the place of that grown in the East Indies, which was affected by a fungoid pest, and that of the West Indies, which was devastated by the white fly. It is now being grown with uniform success in most of the coffee-growing countries of the world,— at the Bahamas, Barbadoes, Bermuda, Calcutta, Ceylon, Dominica, Jamaica, Java, Mauritius, Montserrat, Natal, New Granada, and Rio de Janeiro.

One of the most important achievements at Kew was the introduction of the cinchona or Peruvian bark tree into India and the other colonies of Great Britain.

Some forty years ago great alarm was felt at the high price of quinine, produced at that time entirely from the cinchona trees on the western coasts of South America. It was feared that the supply was becoming exhausted, and for several years attempts were made to procure plants and seeds and start plantations in Southern India. The Dutch Government moved first in the matter and planted them in Java, but they proved to be of a worthless species, the enterprise proved a failure, and the plantations were rooted out. The British Government attempted the same thing, importing plants direct to India, which died on the passage. Finally, in 1859, an agent was sent from Kew to Peru, to select seeds and young trees. These were sent to the experimental gardens of Kew, where they were planted, fed, and nursed. The enterprise proved successful, and the plants, after attaining sufficient vigor, were transmitted, first to India, where plantations were started, and later to Ceylon, Jamaica, St. Helena, Trinidad, Cape of Good Hope, Queensland, and many other places. In the plantations at Bengal there are at least 5,000,000 trees. The plantations at Ceylon are nearly as large, and the sum realized from the sale of quinine, manufactured or produced from these trees, amounts to several millions annually. Aside from its value as an article of commerce, the importance of this drug to the inhabitants of semi-tropical and malarious countries, as a medicinal agent, can hardly be over-estimated.

Another triumph for Kew was the introduction, into the same countries, of the culture of ipecacuanha, which, as a specific for the dysentery, has a value and importance hardly less than that of cinchona itself.

So, also, Kew has been instrumental in the introduction of rubber-bearing trees into the colonies of Great Britain. In short, there is no plant, which has yet been discovered, valuable for clothing, or as a food, or as a medicine, or for the supply of any want of man, to which the resources of Kew have not been devoted. In only one particular can Kew be said to take a position inferior to that of any institution of a similar character, and that particular feature is its arboretum. It must be gratifying to Americans, and to Bostonians, of all Americans, that a British Journal — and that journal so English a sheet as the "Saturday Review" — should make this admission: — "The Arboretum is the richest in Europe, no doubt, but probably inferior to that of Harvard University, where special attention has been paid to this department." The failure of the Kew Arboretum to fulfil expectations, is doubtless due to a shallow, sandy soil resting upon a bed of gravel.

Not the least important feature of Kew is its literary work. Three valuable periodicals are issued monthly: the "Botanical Magazine," edited by Sir Joseph Hooker; "Icones Plantarum," which periodical deals with dried or colorless specimens of plants, and the "Bulletin of Miscellaneous Information." A number of special pamphlets are also published, from time to time, treating of fresh discoveries, and sent to the colonial governors, to museums, and to prominent scientific men everywhere.

I have said that Kew was the parent of other similar institutions. One of the largest and most important of these, is the Adelaide Botanical Garden, in South Australia. This garden was founded in 1855, and is situated on the banks of the river Torrens, which divides the city of Adelaide. It included at first only forty acres. The whole garden now comprises one hundred and forty acres. A Museum of Economic Botany has been constructed, and a Botanical Garden planted. The cost of its maintenance is about $20,000 a year. It includes a Pinery, Arboretum, Conservatory, and Fernery, and is, in its appliances and plan of work in most respects, a copy of Kew. Its experimental grounds comprise about fifty acres of rich chocolate-

colored loam. The utility of the establishment of this garden can hardly be over-estimated. It has largely served the practical wants of the province by experiments in cultivation, and by the distribution of plants and seeds. Vines have been imported from France, and their usefulness in Australia tested. Guinea grass (*Panicum giganteum*) has been proved well adapted to local culture.

Through the agency of Kew and the Adelaide Garden a most valuable fodder-plant, called the sheep bush (*Pentzia virgata*), has been introduced from the Cape of Good Hope into South Australia. Seed was sent from Kew to the Adelaide Garden in 1869. In a report of the work of the garden, this description of the plant is given:—"The leaves and branches contain an aromatic bitterness, which is liked very much by sheep, and which gives the mutton a fine, peculiar flavor." The plant is easily propagated by cuttings, of which every one will grow if planted when the first rains begin to fall.

Other important gardens in the old world, are those at Singapore, in Southern India, and at Buitenzorg, Java, the latter being under the auspices of the Dutch Government. A tourist gives this pen-picture of the Buitenzorg garden, showing that its management is largely in the direction of economics: — "I visited that part of the garden used in the experimental cultivation of shrubs and trees useful in a commercial point of view. One large area was devoted to specimens of the coffee plant, with its laurel-like leaves of a healthy, dark green. There was the pepper tree, with its insignificant leaf; caoutchouc trees I saw, of two or three species, with their leaves and bark full of the precious sap. Much ground was used in the cultivation of divers sorts of tobacco. Cotton, also, was growing here in plenty; so was opium. Cinnamon trees, like vast overgrown laurels, very odoriferous at a certain season, were not wanting. The compactly growing nutmeg tree, hungry of manure and requiring incessant care, was well represented. Cloves and arrowroot; sugar and tea, are produced in these gardens. There is an acre or two of the smooth cactus, which is very valuable on account of the bug — *Coccus cacti* — which generates and lives upon it. This parasitical insect, at a certain season, is brushed off the leaves, and when dried becomes the cochineal, so famous for dyeing." Of course the experience gained by this experimental gardening is carefully diffused over Java.

In this country, the pioneer work in horticultural science was done by Horticultural Societies, of which the Massachusetts was among the first and most important. These were followed later by Botanical Gardens and Arboretums, conspicuous among which are the Arnold Arboretum and the gardens at Washington and St. Louis. Experimental stations have also been established in most of the states, under the auspices of the National Government, where important botanical work is done.

I have spoken of the intimate connection between horticultural or botanical science and the other sciences, and have said that investigations and discoveries in vegetable physiology have led to some of the most important and valuable discoveries in animal physiology. Let me illustrate farther what possibilities for the future lie in this direction.

In the Palm house at Kew,— a picture of tropical beauty, perhaps as perfect as can be found outside the original jungle, and which no one would for a moment suspect contained a utilitarian suggestion — in this Palm house may be found a recently discovered plant (*Gymnema sylvestre*), from the leaves of which an alkaloid can be abstracted, which, taken upon the tongue or into the mouth, deprives one of the sense of taste for forty-eight hours without injurious effects. Side by side with this may be found another plant, called the Miraculous Berry of the Gold Coast, the leaves of which, treated in the same manner, produce a totally different effect, for the decoction cloys the mouth with a saccharine sweetness so great that it matters not what we eat or drink afterwards — it will always have, during the time the effect lasts, the flavor of honey.

If, as the long-continued operation of these drugs would seem to indicate, they have a central, rather than local, effect upon the organ of taste, what is more probable than that a series of experiments with these plants may yet lead to the discovery of the cortical centre of that organ of taste, which has never yet been anything more than hypothetically located.

But some one may ask, Of what use is such a discovery except to add one more scientific fact to the sum of human knowledge? We cannot tell. We do know this, that is is not safe to assume that the discovery of any simple fact in science may not be of great benefit to the world, when so many of such discoveries (not deemed, perhaps, of great importance at the time) used, as they

have been, in the line of other investigations, have been followed by momentous results.

But great as have been the strides of Horticulture in the direction of Economics during the past half century, as the result of experimental study and botanical research its possibilities are still almost infinite.

Professor George L. Goodale, in a very recent address before the American Society for the Advancement of Science, in speaking upon this topic, says that out of 110,000 flowering plants known to botanical science, only about one per cent — a fraction less than one per cent — is utilized by man; and that of the flowerless plants the percentage is much lower; that what is needed is that the promising plants should be systematically investigated under exhaustive conditions. It is not enough that an enthusiast here, or an amateur there, should give a plant a trial under imperfectly understood conditions, and then report success or failure. The work should be thorough and every question answered categorically, so that we might be placed in full possession of all the facts relating to the object experimented upon. To do this, he continues, requires the coöperation of many agencies; Botanical Gardens amply endowed for research; Museums and Laboratories of Economic Botany. We need institutions like those at Kew in England, and at Buitenzorg in Java, which keep in close touch with all the world. The founding of an establishment on a scale of magnitude commensurate with the greatness and needs of our country, is an undertaking which waits for some one of our wealthy men. We need experimental stations; and lastly the coöperation of all who are interested in scientific matters.

A "wealthy man" such as Professor Goodale desired was found at St. Louis, in the person of Henry Shaw. Henry Shaw was a business man of great industry and application — a man of simple tastes and a great lover of nature. He had amassed a large fortune at the early age of forty years, when he retired from business and devoted himself, for the remainder of a long life, to his trees, plants, and flowers. He laid out a garden and planted an arboretum, which, when planting and laying out, he seems to have intended for the purposes to which they were afterwards devoted.

As early as March, 1859, he was authorized and empowered by an Act of the General Assembly of the State of Missouri, to convey certain real and personal estate to trustees, for the purpose of establishing and maintaining a botanical garden. He did not make this conveyance in his lifetime, but devised by his will, executed January 26, 1885, almost his entire estate, real and personal, to trustees named therein, for a botanical garden, a museum, and a library connected therewith, and devoted to the science of botany, horticulture, and allied objects. Mr. Shaw died in 1889, and the Missouri Botanical Garden is now in successful operation, as the result of his bounty.

The appraised value of the property is $3,000,000, yielding in 1890, a net income of $50,000. A large amount of the estate consists of unimproved real estate, lying in the outskirts of the city of St. Louis, which is destined sometime to become of enormous value. This will make it, in the words of Professor Trelease, its Director, "the best endowed institution of the kind, which has ever existed, and will make St. Louis the botanical centre of the new world, and will draw to it students from every quarter of the globe."

Six scholarships have been founded, by means of which successful candidates may, for six years — during the period from fourteen to twenty years of age — receive instruction in economic botany, entomology, and such land surveying and book-keeping as is necessary for the management of gardens and large estates. Furthermore, the instruction is in practical, as well as theoretical gardening; and one qualification of every applicant is to be always insisted on, viz: a taste for the manual labor of gardening.

I have attempted, thus briefly, to demonstrate the utilitarian side of the science of Horticulture, and to show the position it occupies in Economics. The moral remains, or — as Jack Bunsby would say — the bearing of these observations lies in the application of them.

Since the science of Horticulture occupies so important a position in political economy, it becomes a question for Horticultural Societies, *per se* — Societies like the Massachusetts and Worcester County for example —, to consider whether they have not a duty unfulfilled in this regard, and whether the trust imposed upon them, to advance this noble science, is fully executed simply by

the expenditure of their annual income in the distribution of prizes. It is true, there is a certain stage in education when the object lesson is desirable if not necessary; but are they not clinging too long and too closely to kindergarten methods? Should they not initiate some form or method of botanical investigation, or, like their pioneer, the Royal Horticultural Society, plant an experimental garden? Of course the natural reply is, expenditure must be measured by income — limited means will not permit such outlay. We must continue to revolve in the same circle until extraneous aid shall reach us from some source — perhaps from the advent of Professor Goodale's "wealthy man."

But if a beginning were only made in however humble a way, and good results shown, would not the extraneous aid more surely come? And what forbids the Commonwealth, which from time immemorial has taken agriculture under its protection, which has drawn annually so many thousands of dollars from its treasury for the destruction of insect pests, for sanitary purposes, for experimentation in sewage disposal, for a thousand things from which no return could ever be expected — what forbids the Commonwealth from lending to these societies its fostering care, when it can so easily be demonstated that every dollar thus spent will prove a paying investment?

Better still would be a recognition from the general government. And just as the many smaller societies in England and her colonies — of which Kew has been the foster-mother — have been given life, and been enabled to follow in a more modest way, the methods of Kew, through the governmental aid afforded her, so might our own government, by giving an institution like the Missouri Botanic Garden at St. Louis a national character and by making that institution a steward and dispenser of its bounty to other institutions of a like character, become the means of eventually bringing all the horticultural societies of the country in touch with St. Louis as a centre and in touch with each other.

The value and importance of such governmental aid to the science of horticulture would lie, not so much in the annual or periodic appropriations for its benefit, as in the prestige that would arise from such a connection with the government. St. Louis would then become our national Kew. All our military and naval officers, all our missionaries to foreign lands, would become so many agents for its enrichment. All our exploring and

scientific expeditions would contain their corps of botanists, charged with the duty of adding to its treasures, by the discovery of new plants and flora. And from the treasures thus collected at our national centre, there might be such a dissemination to societies of a kindred nature, throughout the land, as to make the work beneficent, beyond conception, "for the relief of man's estate."

These are practical questions which I do not assume to answer. I make these crude suggestions and submit them with the topic under discussion for your consideration.

Discussion.

Rev. Charles S. Harrison of Franklin, Nebraska, connected with one of the state experiment stations, said he had been a home missionary in the great west for a third of a century, and had also endeavored to be a missionary along horticultural lines. He believed the evangel of nature should be proclaimed with the evangel of grace. The wealth of the great west was in the fertility of the soil, and in the brains of the farmer. The west, like many portions of the east, needs a higher rural development. He was much impressed with a visit he made to the farm of Webster at Marshfield, and wished we had the brains of a Webster for every one hundred and sixty acres of land. Then what marvellous results would be attained. For his part he had fifteen acres under high cultivation at Franklin, Nebraska. He was trying to see what would thrive there. He had thousands of choice evergreen trees and shrubs, and farmers would go over his place in utter astonishment, not knowing that such a transformation was possible. He told them he had no patent on this thing; that what he had, they could have just as well. He spoke of two men in Colorado — one, a gaunt, ragged looking man, with a wife to match, and a team which looked like the couple that rode behind them. They were all in a dilapidated condition. The man was cursing the country and the climate and his neighbors; he was all awry with God and man and nature. A little way from him was Jesse Frasier, who went into that country a poor man also, but was now raising $10,000 worth of apples a year. The difference was entirely in the heart and brains of the two men.

Mr. Harrison often told the people of the newer west that in the air and light and earth, all around and beneath them, there were

millions on millions of bushels of luscious fruits; that what they needed was to plant fruit trees, on which all this wealth could gather. He was so much impressed with the possibilities of the great plains, that for years he had been experimenting with Rocky Mountain evergreens. Mr. Fernow, Chief of the Division of Forestry at Washington, visited him. He said he was almost discouraged in the attempt to find an evergreen for the plains. Mr. Harrison took him out to a grove of *Pinus ponderosa*, which he had purposely neglected, — in a place so dry that some years no water could reach the roots; yet these trees had made a foot a year in growth. "There," said he, "is the future sawlog of the plains." Unfortunately *P. ponderosa* is not a success in the east, while *P. Douglassii*, *P. Engelmanni*, and *P. concolor* do remarkably well. He thought that somewhere in the west, perhaps not far from St. Louis, the government should establish a grand Arboretum — to cover at least one township of thirty-six square miles — where the different forms of landscape planting could be shown, and the different kinds of fruits and trees could be tested. Then, at no distant day, there should be another Arboretum for the north and one for the south. He thought that this Massachusetts Horticultural Society, as the mother of kindred societies in the United States, should take the lead in this matter, and use all possible diligence to secure so desirable an object. Our nation is great and rich, and the cost would be light compared with other enterprises which do not show a tithe of the results this would ensure.

Leverett M. Chase believed that our country possesses every variety of soil and climate, and that with the proper application of skill in cultivation, we can grow any and everything. But he wanted very much to see one more crop successfully raised — one which can be produced on farms and nowhere else, and that is a crop of noble men and noble women.

Mr. Chase then moved a vote of thanks to Mr. Parker for his able and very interesting lecture.

William C. Strong rose to second the motion of Mr. Chase, and added that the idea of establishing an experimental garden had engaged the minds of the leaders of this Society from its organization. The matter came up again when the improvement of the Back Bay lands began. Some thought that available space might be secured there; but before any definite plan could be decided

upon the opportunity passed by. We are occupying too expensive a home for our work, and yet have too little room.

Francis H. Appleton felt extremely indebted to Mr. Parker for the valuable suggestions which show what can be done by members of the Society who have the disposition. He thought every member should consider seriously whether the Society is using its means to the greatest and best advantage, by keeping them locked up in this land and building. If it shall become possible in the future to add experimental gardening to our work, or to join, in any practical way, with an established garden, he thought it only reasonable to believe that the Commonwealth might be disposed to entrust funds to the Society — whose objects and evident purposes were to be progressive — to directly promote the public good by practical effort to develop horticultural science.

Benjamin P. Ware spoke especially of the suggestions of the close and intimate relation of horticulture to agriculture. He doubted whether it is generally known how much the community is indebted to this Society for improved and new varieties of vegetables, and for the number of improved fruits and flowers we now enjoy. The original experiments in cross-fertilization by Marshall P. Wilder produced wonderful Camellias and Azaleas. Essex farmers caught the inspiration, and Buxton's Danvers Onion and the Intermediate Carrot, were the first results produced. The Stonemason Cabbage — which is a standard variety the world over — also the Deep Head, and the Improved Savoy Cabbages; the Hubbard, the Essex Hybrid, the Marblehead, and the Improved Turban Squashes; the Essex Tomato, and many other standard varieties of vegetables have been put upon the market by Essex County growers. Not only in Essex County, but in other localities, the farmers and market gardeners have been and are constantly making advances along the line of better quality and character of most varieties of fruits and vegetables. Agriculture is greatly indebted to horticultural experiment and enterprise,— far more so than is generally supposed.

The vote of thanks moved by Mr. Chase was unanimously adopted.

O. B. Hadwen, Chairman of the Committee on Discussion, announced for the next Saturday, a lecture on "Fungi — the Latest Discoveries Relating to their Connection with Horticul-

ture," by B. T. Galloway, Chief of the Division of Vegetable Pathology, United States Department of Agriculture, Washington, D. C. This lecture is delivered on the John Lewis Russell foundation.

BUSINESS MEETING.

SATURDAY, February 11, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER in the chair.

The President announced the Committee to consider the arrangement of the business meetings and meetings for discussion so as not to interfere with each other, as follows: William C. Strong, Francis H. Appleton, and William H. Spooner.

It was voted that, agreeably to the rules of the State Board of Agriculture, three prizes, of ten dollars, eight dollars, and six dollars, be offered for the best reports of Awarding Committees, and that the Committee on Publication and Discussion be requested to award the same.

Adjourned to Saturday, February 18.

MEETING FOR DISCUSSION.

COMBATING THE FUNGOUS DISEASES OF PLANTS: PROGRESS OF THE WORK IN THE UNITED STATES.

BY B. T. GALLOWAY, Chief of the Division of Vegetable Pathology, United States Department of Agriculture, Washington, D. C.

[This Lecture was delivered on the JOHN LEWIS RUSSELL foundation.]

It is my purpose to lay before you today the present condition of our knowledge concerning the most approved methods of combating some of the important fungous diseases of plants. The nature of fungi and the manner in which they produce the various diseases we call blights, mildews, rots, etc., are already generally known to you; consequently it hardly seems necessary to go over this ground again. Doubtless the question of greatest importance to all growers of fruits, flowers, and vegetables, is,

How can such crops be protected from the ravages of fungi in the most economical and practical manner? This question I shall try to answer, but before taking up the matter in detail it would perhaps be well to clearly define the limitation of our discussion.

For convenience the diseases with which we are especially concerned may be divided into two classes, viz. (1), those recuring year after year independently of climatic or other conditions, and (2), those whose prevalence and destructiveness depend more or less on the weather, the soil, and other surroundings. Examples of the first class may be found in black-rot of the grape; leaf-blight of the pear, quince, cherry, and plum; black-spot of the rose, etc. To the second class may be referred such diseases as downy mildew of the grape, potato rot, downy mildew and rot of lettuce, and numerous others which I need not mention here. Of course it must be understood that no sharp line of distinction can be drawn between these classes, since what in one section may properly belong to the first, may in another be referred with equal propriety to the second, and *vice versa.*

It is obvious that the maladies belonging to the first class are more easily combated than those of the second; first, because they appear every season at about the same time, and second, because their progress is more or less regular; therefore, when certain phases in their development occur it is known what to expect. In diseases dependent on climatic and other similar conditions there is an element of uncertainty that often completely baffles the horticulturist. Not knowing what to expect he seldom prepares for anything; consequently before he is aware of it his crops are destroyed.

In the matter of treatment practically the same methods are followed in each class, the only difference being that it is possible in one instance to obtain good results by following certain rules, while in the other success depends largely on the exercise of proper judgment in connection with the rules given. A careful study of the weather, the soil, and other conditions which influence plant growth will in many cases enable the intelligent fruit grower to cope as successfully with one class of diseases as another.

In a study of the weather the daily maps issued under the direction of the United States Department of Agriculture in many of the large cities will be of the greatest service. A striking example of the use to which these maps may be put is to be found in the vicinity

of this city, where acres are devoted to the forcing of lettuce under glass. It is well known that lettuce grown in this way is subject to several diseases which almost invariably manifest themselves under certain partially known conditions of moisture and heat. Every lettuce grower is aware that during the short winter days constant care as regards watering and ventilating is necessary to keep the plants free from rot, mildew, and burn. In all of this work it would be of the greatest service to know when to expect good or bad weather. For example, the sun may be shining brightly, with no indication whatever of cloudy weather; water is applied and immediately it turns cloudy and cold, remaining so for perhaps a week or more. The top soil, under these conditions, does not dry out and as a result rot sets in, and in a very short time the whole crop may be destroyed or rendered worthless. If the cloudy weather could have been foreseen, water might have been withheld and in such a case the plants might have passed through the unfavorable conditions in good shape. By the aid of the maps a gardener, with his knowledge of local meteorological conditions derived from long and continuous observations, might without difficulty have determined from ten to twenty-four hours in advance the coming of just such weather as we have here described. The forecasts, telegraphed over the country and published in the daily papers and elsewhere, are so brief that they do not enable the horticulturist to exercise his judgment at all. With a map before him, however, he has a bird's-eye view of the situation. He sees approaching, a storm area covering thousands of square miles. He can tell pretty accurately how fast this storm is traveling, and can therefore, with a reasonable degree of certainty, predict when its influence will be felt in his region. Further, he can usually tell whether the disturbance will bring rain or snow, much wind or little wind, and the direction from which the latter will blow. All this a few years ago would have seemed incredible, and yet it is possible at the present time for any one who has access to the bulletins issued, and who will use his knowledge of local meteorology to the best advantage, to correctly forecast all the foregoing conditions, at least eighty times out of a hundred. I have dwelt upon this matter at some length because it seems to me an important one, there being nothing so intimately associated with horticulture in all its phases as the weather. This is especially the case with

plant diseases, and yet, despite the importance of the matter, very little is definitely known in regard to the direct relationship existing between plant maladies and weather conditions. A long series of observations will be necessary to establish these relations, and when this is accomplished it may even be possible to predict accurately for some time in advance when a certain disease is likely to appear. This of course will be a great step in advance of our present methods so far as treatment is concerned, and will practically place all diseases on the same footing.

Having now pointed out the differences existing between the two classes of plant diseases, let us consider the methods that may be adopted in preventing them. I shall leave out of consideration entirely methods of culture, taking it for granted that every fruit grower, market gardener, and florist will, in this respect, give his plants the very best treatment possible. Having done this he may rest assured that for the prevention of some diseases his work will be less difficult, while for others his cares and labors will not be lessened at all. You will observe that the word prevent is used in all cases. Few, if any, of the diseases with which we are concerned can be cured, which at once shows how radically different our treatments must be from the ordinary methods pursued in fighting insects. As in the case of the latter, however, when this work was begun, attention was immediately turned to the use of preparations in the form of powders and liquids, which when applied to the plants would protect them from the attacks of their parasitic fungous foes. On its face the problem does not seem like a difficult one, yet when it is looked into carefully it will be seen that the obstacles to be overcome are exceedingly numerous. It was important to find substances that would destroy or render incapable of growth the spores or reproductive bodies of fungi without injuring the plant to which these substances were applied. Further, it was necessary to determine when to apply the substances, how to apply them, and, finally, to ascertain their effects on the crop from a hygienic stand-point. The general results of this work will now be given, it being understood, of course, that perfection has not been reached in any branch of the subject.

Turning our attention first to the preparations employed as fungicides, it may be said that fully a hundred liquids and powders have been used in this country alone for work of this

kind. For work out of doors the powders were soon discarded, as it was found that they were all too easily removed by rain, wind, and dew. The liquids, consisting of various compounds of copper, iron, zinc, etc., were tried with varying degrees of success. Some were found to be of no value whatever; others so seriously injured the plants that their use was abandoned. Several seemed to be efficient fungicides, but owing to the fact that they were easily removed or were too expensive, it was necessary to discontinue their use. Strange as it may seem there is but one preparation that has stood the test of every trial, and it may be placed today at the head of all other fungicides. I refer to the Bordeaux mixture, which is fast becoming almost a household word among the fruit growers of the country. There are preparations cheaper, more easily applied, and possessing greater wetting power* than the fungicide mentioned, but they either lack in efficiency or prove injurious when applied continuously. Bordeaux mixture, as most of you are aware, is made by adding milk of lime to a solution of bluestone or sulphate of copper. The original formula called for 16 pounds of copper sulphate and 30 pounds of lime to 22 gallons of water. These amounts have been reduced, from time to time, until now we use almost entirely, a mixture containing 8 pounds of copper sulphate and 6 pounds of lime to 50 gallons of water. The copper sulphate, which may be obtained in granular form at wholesale at 4 cents per pound, is dissolved in 7 or 8 gallons of water, a 50-gallon barrel being used for the purpose. The lime is slaked in a separate vessel and after thinning to the consistency of whitewash it is poured into the barrel containing the copper sulphate solution and the two liquids are thoroughly mixed, after which enough water is added to fill the barrel. It only remains now to strain the mixture, when it is ready for use. The last operation is frequently omitted entirely, but it certainly saves time in the end to strain out the bits of lime, sticks, and straws, which clog the nozzle and give trouble in other ways. Our custom is to strain through a gunny sack tied over the head of a barrel, the latter having been made perfectly clean by rinsing with water. Frequently

* By wetting power is meant, in this connection, the property liquids possess of spreading evenly over any surface with which they may come in contact. It is something more than mere adhesiveness, for a liquid may possess this quality to a high degree and yet roll up in drops when it strikes a leaf. The drops adhere, but the leaf is not wet at all except in limited areas.

when lime of poor quality is used there is some free copper sulphate present in the mixture, and if such is the case tender foliage is likely to be injured. It is very seldom, however, that anything of this kind happens, but to be on the safe side it is best to test the mixture for free copper sulphate before using. This may be done very quickly and easily by adding to the mixture a few drops of a solution of potassium ferrocyanide or yellow prussiate of potash. If there be the least trace of free copper sulphate present a brick-red color is noticed as soon as the potassium ferrocyanide solution is added. If the mixture has been properly made there is no change whatever in color. An ounce of the potassium ferrocyanide dissolved in 4 ounces of water will answer for testing a hundred barrels of the mixture. Four ounces of the solution having the strength indicated should not cost more than 10 or 15 cents. Paying 4 cents per pound for copper sulphate and from 15 to 20 cents per bushel for lime, Bordeaux mixture prepared in accordance with the foregoing formula will not cost over 1 cent per gallon.

Only one other fungicide is worthy of mention here and that is the ammoniacal solution of copper carbonate. It is made by dissolving 5 ounces of copper carbonate in 3 pints of strong ammonia and then diluting with water to 50 gallons. Before adding the ammonia it is best to stir up the copper carbonate in sufficient water to form a thin paste. If the quantity of ammonia indicated does not produce a clear solution more should be added until this is brought about. The chief points in favor of this fungicide are, (1) ease of preparation and application, (2) cheapness, and (3) the property it possesses of not discoloring the parts of the plants to which it is applied. On the other hand the strongest objection to its extended use is that it sometimes injures the plants upon which it is sprayed. Grapes, for example, sprayed an entire season with it may in all probability be entirely free from disease due to fungous attacks, yet as a rule they do not appear healthy, the leaves in many cases being small and yellow and the wood more or less imperfectly matured. Careful experiments have demonstrated that these appearances are due to the continuous action of the solution on the tender growing parts of the plant. It is frequently more noticeable the second year than the first and is of course much more plainly marked on certain plants and certain varieties than others. It is believed that at

times the solution can be used to advantage without fear of injury to the plants. This matter, however, will be more fully discussed as we proceed.

Having now given you the present condition of our knowledge with respect to the most serviceable fungicides, your attention is called to the second phase of our subject, *i. e.*, when and how to apply these preparations. In a lecture of this kind it is of course impracticable to describe in detail the methods that should be followed in treating each particular disease. The matter can only be considered in a somewhat general way, such information being given as will enable those interested to obtain a clear insight into the nature of the work. As to the proper time for spraying no rigid rules can be laid down. It must be understood that the whole object of the work, as already stated, is prevention; therefore the great importance of doing everything in time can not be too strongly urged. A grape, for example, no sooner puts forth its leaves than the spores of the black rot fungus are ready to infect them. The same is true of the berries as soon as they form; therefore, to protect both leaves and berries it is necessary to begin spraying at least a week or ten days before the fungus usually appears. Experience has shown that this period coincides quite closely with the time when the leaves are one third grown; consequently we recommend in all of our publications that the first treatment be made as near as possible to the date mentioned. In ten or twelve days the vines will have made sufficient growth to require a second application, and so the work is continued until five or six treatments in all have been made. Practically this plan is followed in all of our work, the number of applications and the times at which they are made varying with the different crops.*

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*DIRECTIONS FOR TREATING SEVERAL IMPORTANT PLANT DISEASES.

APPLE BITTER ROT, *Glœosporium fructigenum* Berk.

Remove from the trees and destroy during the winter or early spring all shriveled apples. Spray with Bordeaux mixture, first when the fruit is the size of marbles, again in two weeks, and a third time a month later. The rotten apples that fall to the ground during the growing season should be collected and fed to the hogs or destroyed. The cost of the treatment for ordinary-sized trees will be about 10 to 15 cents each.

APPLE LEAF SPOT, *Phyllosticta, Phoma, etc.*

Spraying with Bordeaux mixture the same as for bitter rot will usually hold this disease in check. It would probably be well, however, to allow only two weeks to elapse between the time of the second and third sprayings. If the season is rainy a fourth spraying should be made three weeks after the third.

Bordeaux mixture is the principal fungicide used and it can be recommended unqualifiedly for all the diseases with which we are especially concerned. In certain cases, as for example the treatment of black rot of the grape, the cost of the work can be materially decreased by using both Bordeaux mixture and ammoniacal solution. The former should be applied two or three times in the early part of the season while the latter may be used for the later applications. Treatments carried out in accordance with this plan rarely injure the most tender plants; moreover they have the special advantage of not spotting or otherwise disfiguring the fruit at a time when such disfigurement is likely to decrease its market value.

Probably one of the most important questions in connection with the work under consideration is the manner in which the fungicides are applied. Every precaution should be taken in preparing the mixtures, solutions, etc. They may be applied at just the right time, and yet unless the work be properly done, in nine cases out of ten failure will result. When we first began to apply fungicides there were no machines entirely suited to the work. In many cases old brooms, wisps of straw, watering cans, syringes, and

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APPLE POWDERY MILDEW, *Podosphæra oxyacanthæ* (DC.) D By.

This disease is troublesome only in the nursery, where it is especially injurious to seedlings. Spray with ammoniacal solution of copper carbonate; first when the leaves begin to unfold and thereafter at intervals of two weeks until five or six treatments in all have been made. Endeavor to make about four sprayings before budding the stocks and two after this operation has been performed. The cost of six treatments, using proper machinery, should not exceed 6 or 8 cents per thousand trees.

APPLE SCAB, *Fusicladium dendriticum* (Wallr.) Fckl.

Spray with Bordeaux mixture; first, just as the flower buds begin to open; second when the petals of the flowers are falling, and third when the fruit is the size of peas or slightly larger. If the season be rainy a fourth treatment should be given ten or twelve days after the third. Four ounces of Paris green added to each 50 gallons of the mixture at the time of the third spraying will hold the codling moth in check. The Paris green should first be made into a thin paste by adding a little water. This paste readily unites with the mixture and does not seem to decrease its value in any way. The cost of the work as here described will range from 4 to 5 cents per tree for each application.

CHERRY LEAF BLIGHT, *Cylindrosporium padi* Karst.

In the nursery, spray with Bordeaux mixture; first when the leaves are about one third grown. In two weeks spray again, following with a third application fifteen days later. Adopting this plan, three sprayings will be made before budding, after which two more applications at intervals of two or three weeks should be given. In the orchard, four or five applications of the Bordeaux mixture should be made, beginning when the leaves first appear and repeating at

various other contrivances were used as a means of distributing the preparations, the result being in many cases imperfect work and consequent lack of success in holding the diseases in check. It should be borne in mind that to be effective a fungicide must be applied in such a manner that all parts of the plant exposed to the attacks of the fungus are thoroughly protected. In other words the ideal in this matter is attained when the preparation applied forms an even film over the entire surface of the leaf, fruit, or other part of the plant it is intended to protect. For many reasons it is difficult to attain the ideal, yet it may safely be put down that, other things being equal, the more finely the liquid is divided as it is thrown upon the plant the more evenly will it be distributed. To break up the liquid into a mist-like spray requires a specially constructed nozzle and a good strong force-pump. The nozzle in addition to being durable, inexpensive, and simple in construction, must be provided with some means of quickly removing any obstruction that may lodge in the necessarily small orifice through which the liquid is forced. All these requirements are found in the Vermorel nozzle, which has from time to

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intervals of two weeks to twenty days. The cost of treating unbudded nursery stock usually averages from 20 to 25 cents per thousand trees. The second year the cost will be slightly more as the buds will make more growth than the stocks. The third year's treatment will average from 30 to 35 cents per thousand trees. In the orchard full-bearing trees may be sprayed as described above, at a cost of from 12 to 15 cents each.

CHERRY ROT, *Monilia fructigena* Pers.

This has proved a difficult disease to treat. It causes the greatest loss in rainy seasons, appearing suddenly and destroying great quantities of fruit just about the time the ripening process begins. Some benefit has resulted from the use of Bordeaux mixture, applied every six or eight days, beginning twelve or fifteen days before the cherries ripen. It has proved very difficult to make the mixture stick to the fruit and doubtless this is the chief reason why the rot has not been more readily prevented. As a means of increasing the wetting power of the mixture it is suggested that two or three bars of Ivory soap be added to each 50 gallons of mixture. The soap should be first shaved up and melted in about a gallon of water. Add the melted soap to the Bordeaux mixture and stir thoroughly in order to effect a perfect union.

GRAPE BLACK ROT, *Guignardia bidwellii* (Ellis) V. & R.

Spray with Bordeaux mixture; first, when the buds begin to open. Spray again when the leaves are one third grown, and a third time when the vines are in full bloom. After this apply the fungicide every ten or twelve days until the first sign of ripening fruit; then discontinue all treatments. Good results will follow the use of Bordeaux mixture for the first three sprayings and ammoniacal solution of copper carbonate for the others. The course of treatment first described will cost about 2½ cents per vine; using the combined fungicides the cost will be reduced to 2 cents per vine.

time been improved until now it is well nigh perfect. The style of pump to be used depends somewhat on the nature of the work in view. For an all round apparatus, involving work on moderately low-growing crops, such as dwarf pears, grapes, raspberries, blackberries, strawberries, potatoes, etc., we have found nothing better than the knapsack form of sprayer. If there are twenty-five or thirty acres of such crops to treat, however, it will pay to use horse power machines. These are now on the market in various styles, ranging in price from $50 to $75. Some of these machines are automatic, *i. e.*, force the liquids through the nozzle or nozzles by means of pumps operated by specially constructed gearing. As a rule we have not found this style of apparatus very satisfactory, as it offers little opportunity to properly control the spray. It is, moreover, expensive, and being necessarily complicated is apt to get out of order. The most satisfactory apparatus we have used for general work is a simple one, which may readily be constructed at home. It consists of a barrel, mounted head up, on either light truck wheels or a sled made of heavy, durable timber. In case wheels are used the barrel should be swung between them so that its bottom will rest about eight inches from the ground. Barrels mounted in this way and designed to be drawn either by hand or horse-power may be obtained from almost any seedsman. Having procured and

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GRAPE DOWNY MILDEW, *Plasmopara viticola* (B. & C.) Berl. & De Toni.

Spray with Bordeaux mixture; first soon after the berries are formed. Make a second application of the same preparation in twelve or fifteen days, followed by others at similar intervals until the fruit begins to ripen. In regions where both black rot and downy mildew prevail the treatment for the former will hold the latter in check.

PEAR LEAF BLIGHT; CRACKING AND SPOTTING OF THE FRUIT, *Entomosporium maculatum* Lev.

In the nursery spray with Bordeaux mixture as recommended for cherry leaf blight. For combating the fungus in the orchard, where it causes the premature fall of the leaves, and the cracking and spotting of the fruit, spray first with the Bordeaux mixture about the time the flower petals fall, make a second spraying ten days later, and follow after two weeks with a third. The cost of treating full-grown standard trees as recommended will average from 10 to 14 cents per tree. Dwarf trees may be treated for about one third less.

PEAR SCAB, *Fusicladium dendriticum* (Wallr.) Fckl.

For this disease, follow the directions laid down for apple scab.

QUINCE LEAF BLIGHT AND FRUIT SPOT, *Entomosporium maculatum* Lev.

Treat the same as pear leaf blight. The cost will average about 10 cents per tree.

mounted the barrel, the next important step is to attach a good, strong, durable, double-acting force-pump, provided with two lines of discharge hose, each about twenty feet long. Fasten the pump by means of wood screws to the head of the barrel, as near the edge as possible. The suction pipe should extend to within an inch of the bottom of the barrel and should have upon its free end a coarse strainer. For filling the barrel an opening six inches long and four inches wide should be made in the head. Some means of closing the opening should be provided, but this is a matter so simple in its nature that it is hardly necessary to say anything further about it. With the attachment of a nozzle to the free end of each hose the outfit is complete. A machine made in accordance with the foregoing plan will cost from $20 to $25, and will require for orchard work a horse and two men to manipulate it. When used in the vineyard, however, or in spraying low-growing crops a horse and one man are sufficient to operate it.

As an indication of what can be done with the various machines mentioned, it may be said that in vineyard work one man with a knapsack pump can spray from four to five acres a day. With an automatic horse power machine operated by two men, from seventeen to twenty acres a day can be sprayed. With the barrel apparatus drawn by one horse and operated by two men, ten acres may be counted a fair day's work.

Having now reviewed the various questions connected with fungicides let us turn our attention to a matter which of late has attracted more or less attention in the horticultural world, viz., the relation of spraying to the public health. We are all willing to admit, of course, that copper in any form is not a desirable food. While we are willing to admit this, some of us are not prepared to accept the published statements to the effect that it is to be classed with the virulent poisons. I may say without entering upon any lengthy discussion of the matter, that all the evidence goes to show that fruit properly sprayed with the Bordeaux mixture and other fungicides containing copper is entirely harmless. This statement, it must be borne in mind, is not based upon theoretical grounds or presumptive evidence. It is founded on carefully made chemical analyses and field experiments extending over a period of three years. Granting even that this evidence is faulty we have a much stronger refutation of the statement as to the danger of this work in the

mere fact that thousands upon thousands of fruit growers the country over are spraying every year with fungicides, and as yet not a single authenticated case of poisoning from eating fruit thus treated has been brought to our attention.

In conclusion I wish to call attention once more to the importance of doing everything at the proper time and in the proper manner. Success in this as in everything else comes only after careful work and rigid attention to details. Study the subject thoroughly in the field and library, and I am sure that every moment thus expended will be amply repaid in better crops, better prices, and, what is more important, the satisfaction of knowing that you have made a good fight for what is rightfully your own and have succeeded.

At the conclusion of the lecture, Mr. Galloway gave additional remarks on weather maps. He stated that the maps were issued twice a day at Washington, being prepared from data collected at nearly one hundred and sixty stations in the United States and Canada. At these stations observations were made daily at 8 a. m. and 8 p. m., 75th meridian time. In making the observations it was noted whether the weather was clear, cloudy, snowy, or rainy. The temperature, barometric pressure, direction, and velocity of the wind, etc., were also determined, and as soon as possible all of this information was telegraphed to Washington. From Washington the data were sent to various commercial centers, where maps were also prepared and distributed for general information. He next displayed a series of maps made at Washington and extending from December 6 to December 12, inclusive. These maps showed the general path of a storm over the country. Originating in the extreme Northwest or Southwest the storms pass easterly at the rate of from twenty-five to thirty-five miles an hour. Thus the track may be easily followed and the disturbance noted fully thirty-six hours before it arrives.

The lecturer then exhibited many photographic views of fields, vineyards, and orchards, located in various parts of the country, each showing treated and untreated plants. The striking contrasts gave conclusive evidence of the advantage of using fungicides. One prune orchard in California was, in part, treated for leaf rust and with success. The portion that was not sprayed was attacked and the foliage all fell off before midsummer. One case was where black rot of the grape prevailed. The portion treated

ripened its fruit while the untreated portion was wholly worthless. Some other photographs showed knapsack pumps and larger apparatus for use in spraying, some of the pictures being views of these machines in operation. Several kinds of nozzles were also shown. Mr. Galloway said that each had its advantages and that all would serve the purpose if properly used. He spoke in praise of the Vermorel nozzle, saying that one must rely on an instrument that could be readily cleared of obstructions.

Discussion.

Samuel Hartwell asked how much of the Bordeaux mixture was required to properly spray a vine or tree during a season.

Mr. Galloway replied that for grape vines five or six years old 1 gallon per vine would answer for the season. For a dwarf pear tree it required from 1 to 2 gallons for each treatment, and for an apple tree twice this amount of liquid was necessary. Of course the amount of liquid used would depend on the size of the tree, the kind of machine used, and the experience of the operator.

Benjamin P. Ware inquired how long after mixing the Bordeaux mixture could be safely used?

Mr. Galloway answered that Bordeaux mixture should not be used after having stood a week or more. It is always best to have the mixture perfectly fresh.

In answer to an inquiry from a lady as to how many diseases had been successfully treated, Mr. Galloway said the question was a difficult one to answer off-hand. This work had been in progress only a few years, but he thought that in that time more than a hundred plant maladies had been brought under the control of the horticulturist.

In reply to a question by E. W. Wood as to the possibility of checking lettuce diseases by spraying; also as to the effect of sub-irrigation on lettuce diseases, Mr. Galloway said that the whole question of lettuce diseases was exceedingly complicated. Spraying he thought was undesirable; moreover from the very nature of the crop he did not believe it would ever prove of much value. The prevention of lettuce diseases, or in other words the growing of a good crop of this vegetable under glass, must be accomplished by rigid attention to methods of culture. Heat, light, moisture, and soil must all be watched with the greatest care. Good crops, almost entirely free from disease, were being grown every day,

but the men who grew them could hardly give the reasons for their success. There are not enough data on the question of sub-irrigation to warrant any conclusions as regards its effects in preventing rot and other diseases of lettuce.

Mr. Ware suggested on the ground of economy of storage space and expense, that special carriages for conveying the spraying mixtures in quantity, are wholly unnecessary. He found a common express wagon more satisfactory. The barrel containing the liquid could be set in it just as well. In spraying a field of potatoes, the horse would pass between two rows, the wheels would reach outside of the same two rows, and the spraying would cover four rows each side of the wagon as well as those two rows, making ten rows at each crossing of the field. In spraying trees the wagon, being higher than the special carriages, brought the operator nearer to the work; this was an advantage, as the finer the spray the shorter the distance the mixture can be thrown. He considered the express wagon better than any other vehicle in all field work in this line. Another thing he would mention; as Paris green settles quickly, he added to the apparatus a small branch-pipe leading directly from the pump into the barrel and reaching nearly to the bottom, thus keeping its contents thoroughly stirred up all the time the pump is being worked.

Mr. Galloway regarded Mr. Ware's suggestion as a good one. He stated that many large orchardists and vineyardists spray their crops in this way.

In reply to Mr. Wood, who inquired about rust on pinks and also about black knot of the plum, Mr. Galloway could give no information as to any method of treating black knot successfully. Kerosene emulsion had been used, but he doubted its efficacy as a preventive or cure. Regarding pink rust, no results as to remedies had been reached.

Francis H. Appleton asked whether the New York law in regard to the destruction of plum trees affected with black knot is enforced, and if so what had been the result.

Mr. Galloway said that he did not think the law was generally enforced. In some sections an effort was being made to carry it out, but on the whole he thought very little attention was paid to it. The trouble was not with the law but with the people, who were not sufficiently interested in it to enforce it.

The President asked whether spraying should be continued until the fruit is ripe.

Mr. Galloway said that as a rule the fungicides are applied when the fruit is young. He would recommend desisting when the fruit begins to ripen. At one time the grape growers upon the Hudson River were over zealous in this matter, and although the season was a dry one they sprayed their vines continuously until the fruit was ripe, and when the fruit was gathered and sent to market it was covered with Bordeaux mixture. The experience of growers varied under different circumstances, and in each case the treatment must be governed by existing conditions. In a dry season, other things being equal, two or three applications would be sufficient. In spraying for apple scab the last application should be given when the fruit is about the size of marbles.

In reply to a question upon the treatment of peach rot, Mr. Galloway said that the disease is caused by the same fungus that attacks plums, and that no remedy yet tried had been successful to any appreciable extent. The leaves of the peach are quite tender, and therefore sprays should be applied with caution.

The thanks of the Society were unanimously voted to Mr. Galloway for his interesting paper.

O. B. Hadwen announced for the next Saturday, a paper upon "Wild Flowers and Ferns," by Mrs. P. D. Richards, of West Medford.

It was also stated that for the last lecture in this course, instead of the paper on Forestry by J. B. Harrison of Franklin Falls, N. H., as announced in the programme, James Comley, of Lexington, had kindly consented to give a paper upon his recent visit to Japan.

BUSINESS MEETING.

SATURDAY, February 18, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

The Secretary read a circular from Francis H. Appleton, Trustee and Secretary of the Massachusetts Society for Promoting Agriculture, announcing that James E. Owen, C. E., of the

State of New Jersey, would speak in Massachusetts at three meetings, in Beverly, in Worcester, and Boston, upon the celebrated Highways of his State, and the legislation under which they were constructed, and cordially inviting the public to attend.

Adjourned to Saturday, February 25.

MEETING FOR DISCUSSION.

Wild Flowers and Ferns.

By Mrs. P. D. Richards, West Medford.

What I shall say about wild flowers and ferns will be mostly about those I have seen growing either in their own homes or in cultivated grounds.

I have selected for description or notice, those only which seemed to me most worthy of our attention, either for beauty, rarity, or some other attractive quality, as it is impossible in the time allowed to me this morning, to even mention the names, except as a mere list, of the nearly five hundred native plants shown to the public in 1886, under the auspices of this Society.

What a fund for entertainment and education is to be found out of doors! Pleasures pure and simple for those who have eyes for seeing and minds for understanding. The early spring — after the close winter, which has kept you from the woods and fields — is getting ready for you its ever interesting and varying exhibit.

First, after the bright, fresh grass which gives token of the new life, as an object of interest, is the Hepatica or Liver-leaf (*Hepatica triloba*). This you will find on the wooded hill-sides in warm, sheltered places, as early as the first of April, if the weather has been favorable. If you have great desire to look into its bright, winsome face before that time, take up a well-budded root in the autumn, and if well cared for it will give you pleasant greeting in the first month of the new year. I experimented with a plant several years ago, that was well blossomed on the tenth of January, and continued flowering for two months, the last petals falling off on the tenth of March, just as the new leaves were appearing.

The Spring Beauty (*Claytonia Caroliniana*) is another charming flower of this season, and can be found from Maine to Minnesota,

according to the "Manual," but is not found wild in this part of our State. In fact only one natural location is given in the "Middlesex County Flora," Ashby — in the extreme western part of the county — where all sorts of entrancing things, not within our reach here, grow. Minot Pratt, of Concord, that indefatigable and enthusiastic botanist, who brought to the classical town so many treasures from the far off wild woods, beautified his own grounds with this plant, and if one could see on a sunshiny April day the mass of pretty rose-tinted, red-lined flowers just inside of the old stone wall in front of the Pratt place, there would be no question in his or her mind about the fitness of the common name, for it is indeed one of the beauties of spring.

In this vicinity, I should look for Bloodroot (*Sanguinaria Canadensis*) next. This sends up a beautiful, indented, sheath-like leaf enclosing the flower bud. The brilliant star-like flower soon opens, and well repays one for the trouble of a long walk. This plant loves moisture, and you will find its home near running brooks in the moist earth; also by rocks on the hill-side when the ground is springy. This makes an excellent garden plant. You can bring home roots with leaves and buds, which can be kept in deep saucers or platters until the flowers blossom and fall; then put the plants in the earth, and they will be almost certain to give leaf, bud, and blossom when another April sun sends its genial warmth upon the earth.

The Mayflower (*Epigœa repens*) is too well known to need any description. Although not within easy reach of our city, its popularity brings it here in great abundance. It is to be hoped that care is taken in the gathering, so that there need be no fear of its being exterminated.

The Golden Saxifrage can be found in sluggish brooks or swamps if you look carefully for it. And when you find how minute the flower is, you wonder how it can bear the burden of its long name, *Chrysosplenium Americanum*, and you resolve from that moment that nothing will tempt you to give it any other than its common name. The little, greenish-yellow flowers are, however, very interesting when seen through a powerful glass, and, as it is still early spring, every flower counts.

The Early Crowfoot (*Ranunculus fascicularis*) dots the southern hill-sides with its bright yellow flowers, and *Cassandra calyculata*, with its racemes of white heath-like bells and leathery

looking leaves, adorns the upland meadows. The swamps and slugglish streams are aglow with the Marsh Marigold (*Caltha palustris*) and the "honey-yellow flowers" of the Spice-bush (*Lindera Benzoin*) greet us with their pleasant fragrance.

The beautiful Dog's-tooth Violet (*Erythronium Americanum*) — which is not a violet but a lily— often opens its flowers in the latter part of this month, and sometimes it keeps flowering for several weeks.

Those who botanize in a systematic way, know that location has much to do with the early and late blossoming of plants of the same species, and direct their steps when seeking some flower, according to the time of the month. The Dog's-tooth Violet location that I visit, is really one continuous plat of plants, by the side of the brook, branching off into the swamp and running down the hills, but I am sure to find in about the same places, the early blossoms, the middle season, and the late flowers.

If you wish this plant for the garden, always take up those that are in bud or flower — so as to be certain that the plants are mature — and if you dig deep enough and take a little earth below the bulbs, they will flourish finely in damp, cultivated ground. The foliage is so beautiful, with its pale green, mottled leaves, that a little plat of it is very attractive, even if the blossoms do fail to appear.

The Wind-flower or Anemone (*Anemone nemorosa*) is common, but varies in beauty according to location, and is, perhaps, not quite so attractive as the less common Rue-anemone (*Anemone thalictroides*) with its umbels of pure white flowers surrounded by the rue-like leaves.

Another desirable April flower for the garden is the Pasque-flower (*Anemone patens*, var. *Nuttalliana*) which grows so abundantly on the western prairies. "H. H." says in her description of the Colorado Flowers: "The first Colorado flower I saw was the great blue wind-flower, or anemone. It was brought to me one morning, late in April, when snow was lying on the ground, and our strange spring-winter seemed to be coming on fiercely. The flower was only half open, and only half way out of a gray, furry sheath some two inches long; it looked like a Maltese kitten's head, with sharp pointed blue ears,— the daintiest, most wrapped-up, little blossom. 'A crocus out in chinchilla fur!' I exclaimed. 'Not a crocus at all; an anemone,' said they who knew."

My acquaintance with these plants dates from May 3, 1888, at which time I received a box of them from Minnesota. They were entirely new to me and unknown, but they really had a familiar look, as an acquaintance had recently described to me what he supposed to be a large hepatica that he had found in the West, and my first thought was that this was that flower, and it probably was, as he had no knowledge of botany and had, from a similarity of appearance, mistaken the name. Another season I received good roots of the plant, which gave me a flower the third week in April of last year. And I am looking forward to the pleasure of seeing many more in the coming spring, for I think my plants are now well established.

The violets should, perhaps, next claim our attention. They are found sparingly in April, but are very abundant in May.

The Arrow-leaved Violet (*Viola sagittata*) loves the southerly hills and well sheltered valleys, and is the advance guard of this family. Soon will follow the Dog Violet (*Viola canina*, var. *Muhlenbergii*), which can be found in damp, shady grass, not far from the brooks, and will be readily distinguished from the other blue violets by its leafy stem and creeping branches. The common Blue Violet (*Viola palmata*, var. *cucullata*) grows abundantly by the brooks and in the meadows; and by its side or near it, the Sweet Violet (*Viola blanda*), the Lance-leaved Violet (*Viola lanceolata*), and the Primrose-leaved Violet (*Viola primulæfolia*); the last three being our white violets. The Bird-foot Violet (*Viola pedata*) loves the higher lands and can be found in fields, pastures, and woods; and, perhaps, if you look carefully and long you may be rewarded with variety *bicolor*, with its velvety upper petals looking so like a real pansy. The Yellow Violet (*Viola pubescens*) grows in the woods, and while you are looking for that, remember that the Canada Violet (*Viola Canadensis*) is also found in woody places. The least common of the violets, excepting the Canada and Yellow, is *Viola palmata*, whose leaves are usually hand-shaped, the flower large and often pale violet-blue. It is found on the slopes of thinly wooded hills, and sometimes by the roadside.

It makes a very interesting collection, if you can procure the violets all at one time, placing small bunches of each with their leaves, surrounded by moss to keep them distinct, in a deep dish or platter. Your friends will exclaim with delight, and say, as I

have heard people say with regard to similar collections, "I didn't know there were so many kinds — I thought violets were only either blue or white."

Whoever has botanized in May will remember the bright picturesqueness and extreme loveliness of the woods and hills. To me no other season has quite the charm this has. In one particularly lovely scene large, ledgy rocks jut out from the side of the hill. Rough and full of crevices is the background Nature had to work upon. A little earth thrown here and there is the beginning; then a few spores and seeds wafted by the winds and dropped by the birds. Result — wherever there is a cranny or nook, a fern or plant has established itself. Strong, bright *Aspidium marginale*, delicate *Woodsia obtusa*, the clinging *Polypodium vulgare* or Rock Fern, and almost hidden in a crevice the rare, beautiful *Asplenium Trichomanes*. The Early Saxifrage (*S. Virginiensis*) with its clusters of small, white flowers, is quite at home anywhere on the rocks where it can find foothold, and the graceful Columbine (*Aquilegia Canadensis*) with its beautiful blossoms like torches of flame, is set singly and in clusters in the clefts, where one would suppose it impossible for a plant to find nourishment. Large leaves of the Bloodroot are at the base of the rocks, and a little lower down the hill are the pretty Rue-anemone and small Solomon's Seal (*Polygonatum biflorum*). And as you ascend the hill you find the earth at the top brightened with the Early Crowfoot (*Ranunculus fascicularis*).

The treasures of this and the summer months are so great and varied that it is extremely difficult to know which to select for notice, although there are certain flowers that one must never ignore, as who would ever presume to speak of the flowers of May and omit Rhodora (*Rhododendron Rhodora*) and Painted Cup (*Castilleia coccinea*), which last year were at their best in the second and third weeks of this month.

Corydalis glauca (the Pale Corydalis), with its rose-colored flowers tipped with yellow, is a rock flower, and seems to be content with as little nourishing soil as the brilliant columbine.

The Smilacinas, the Buttercups,— of which you will easily find four species, including *Ranunculus multifidus* (the Water Buttercup),— the Bellworts, and the Trilliums are all found at this time of the year.

Senecio aureus (Golden Ragwort), true to its name, brightens up the meadows; the *Clintonia borealis* with its greenish yellow bells

is sparingly found in damp grounds, and the Bearberry (*Arctostaphylos Uva-ursi*) now and then covers the rocks and ledgy hills with its thick evergreen leaves, being alike attractive both in flower and berry. The common western name of this plant is Kinnikinnick.

Goldthread (*Coptis trifolia*), with its glossy leaves and gold-colored roots, must not be passed by, even if its small, white flower does come and go, almost, while one is hunting for it, for it is one of the plants that can be used for winter decoration. A few plants with roots put into a glass vase, have an attractive look and can be kept all winter, and will give you flowers and new leaves before the warm days of spring.

The Mandrake (*Podophyllum peltatum*) and the Shooting-Star of the prairies (*Dodecatheon Meadia*) are both fine showy plants, well adapted to garden culture.

Ledum latifolium (Labrador Tea) grows sparingly in cold bogs, and can be found in a few locations within an hour's ride of Boston. Its beauty and rarity will repay one for a long and tiresome search for it.

Menyanthes trifoliata (Buckbean) also grows in the bogs, but if you wish to see this lovely flower at its best, you must seek it in its own home. Before I ever saw it, its rare beauty had been described to me, but I was told as I tell you, that I must see it growing. So one of my botanical friends properly introduced me to what I sometimes think is the most delicately beautiful of all the flowers of May. The upper surface of the funnel shaped corolla is white-bearded; this gives to the racemed flower its peculiar charm.

The Fringed Polygala (*Polygala paucifolia*), which is generally rose-purple, though sometimes, "rarely pure white," is thus finely described by John Burroughs: "When we came upon them beside an old wood road, it was as if a flock of small, rose-purple butterflies had alighted on the ground before us. The whole plant has a singularly fresh and tender aspect. Its foliage is of a slightly purple tinge, and of very delicate texture. Not the least interesting feature about the plant is the concealed fertile flower which it bears on a subterranean shoot, keeping, as it were, one flower for beauty and one for use."

During a botanizing trip last May, which was taken specially to have the pleasure of seeing the White Fringed Polygala in its own home, I was told by my host that there was a possibility of finding

the Painted Cup (*Castilleia coccinea*) in a meadow near by, which we would visit if the owner would give us permission to gather the precious flower. The request was made and this was the answer, sadly given: "I am so sorry, but there are no Painted Cups now, and have not been for a long time. One Sunday when I came home from church I met Mr. ——— and two friends, with their hands filled with big bunches of the pretty flower, and since that day I have never found a single plant in the meadow. I am so sorry, for I did so love to have them to take to church on Children's Sunday. But," she said, brightening up a little, "the Rhodora grows back of the barn, and the Blue Fringed Gentian (*Gentiana crinita*) by the brook here," pointing to some low land through which a small stream made its way.

What treasures on one small farm! Rhodora, Painted Cup, and Fringed Gentian — three of our most charming flowers, which had been immortalized in verse, close neighbors to each other! And how sad the thought that some one who ought to have known better had exterminated one of them.

If you really love the growing life about you, do not carelessly and recklessly destroy it. Take with care what you need and can use, but be sure that you do not eradicate comparatively rare species. I say comparatively rare, because my oldest botanical friend will seldom allow that a plant is really rare. Also, when you find fine specimens by the pathside, leave them, when you can, to gladden the eyes of other passers-by.

An excellent pteridologist wished to examine, for scientific purposes, *Woodsia obtusa*, a very pretty fern and not common in this vicinity; but the specimen most convenient for him to take, looked so lovely he could not bring his mind to the point of disturbing it, and so I presume it lives in its own home even to this day.

The last of May brings to us the first of the Orchis Family — *Orchis spectabilis* (the Showy Orchis) with its two shining leaves and its scape of whitish pink-purple flowers. This is rare in this vicinity. The first of the Lady's Slippers (*Cypripedium acaule*) can be found abundantly if you know just where to look, according to a flower report given last summer. It said "The great vase of pink lady's slippers shows that Boston children who can get into the woods may claim their orchid conservatories as well as the rich."

If you look very carefully through the bogs and low woods you may find *C. pubescens* — the Large Yellow Slipper — and if you do, you may consider it one of the red-letter days of your life; and you will be forgiven if you shout to the full extent of your voice, as an old botanical friend of mine did, when this same plant surprised him with its golden-hued slipper.

These Cypripediums make good garden plants, being very satisfactory under cultivation. A lady who has a wild garden of over one hundred plants, wrote to me last summer that she had twenty-five blossoms of the yellow slipper, having both the large and small, and both doing equally well.

When I call to mind the flowers of the first of June, I always think of the Arethusa and Pitcher Plant because I used to find them together at that time before the march of improvement took away their sustenance.

The Wild Calla, Erigerons, Cornels, and Viburnums, soon follow; and from the second to the third week we may expect to find the Wild Roses.

Have you ever noticed in your walks and drives what an important factor in nature the wild rose is? There is no plant that seems to be used so profusely and effectively by Nature for decorative purposes! By the roadside, in the thickets, along unsightly walls, the edges of swamps, and also attractive groups in the pastures — wild roses here, there, and everywhere.

> "A rose is sweet,
> No matter where it grows; and roses grow,
> Nursed by the pure heavens and the strengthening earth,
> Wherever men will let them.
> Every waste
> And solitary place is glad for them."

And then they come so early and stay so long! You ought to be able to find them from the middle of June until the first of August; and the last lingering blossom will possibly stay until past the middle of the latter month. I found, one year, a single rose — *Rosa Carolina* — on August 20. As I was entering a small swamp, its beauty beamed upon me from afar, and it was surprising to see how one small rose could brighten the scene.

If you wish to study the roses and learn their scientific names, you will have little difficulty if you give close observation. You will readily find four species and possibly five.

Thoreau says in his Journal of June 16, 1854, after describing the roses, *nitida*, *lucida*, *rubiginosa*: "I bring home the buds of the three, ready to expand, at night, and the next day they perfume my chamber. Add to these the White Lily — just begun — also the Swamp Pink and the Great Orchis and Mountain Laurel, now in prime, and perhaps we may say that the fairest flowers are now to be found, or say a few days later."

The orchids for this month are both attractive and rare, the "great orchis" (*Habenaria fimbriata*), mentioned by Thoreau, and *Cypripedium spectabile*, being the most beautiful. *Pogonia verticillata*, *Liparis Lœselii*, and *Habenaria Hookeri* are very rare in this vicinity; but *Habenaria virescens*, *Pogonia ophioglossoides*, and *Calopogon pulchellus* are not uncommon.

The Pyrolas and Chimaphilas are among the pretty June flowers, and *Linnœa borealis* (Twin-flower), beloved by the great Linnæus, begins to blossom about the middle of this month. Linnæus, during his journey through Lapland, gathered it at Lycksele on May 29, and chose it for his own special flower. Previously this pretty and singular little plant had been called *Campanula serpyllifolia* (Thyme-leaved Bell-flower) but Linnæus, prosecuting the study of plants on his new principle, soon found this to constitute a new genus. And after he became famous as a scientific botanist, he allowed his friend, Gronovius, to publish an account of it and give to the plant his name.

If you wish for special adornment for a corner of your garden, put in it that gold-colored flower, *Genista tinctoria* (Woad-Waxen), which so completely covers the hills of Salem and Lynn at this time of the year. Those same hills have been compared, when the Woad-Waxen is in its prime, to "a field of the color of gold, if it be not the 'Field of the Cloth of Gold.'" I greatly enjoy some thriving plants that I brought from Essex County a few years ago.

In the first days of July we have the interesting Milkweeds, *Asclepias purpurascens*, *A. phytolaccoides*, and *A. obtusifolia;* the brilliant lilies, *Lilium Philadelphicum* and *L. Canadense*, and the pretty little blue Day Flower (*Commelina Virginica*), which is so easily naturalized here that I want to recommend it for the wild gardens which are interesting people so much in these progressive days. This plant begins to grow wild in Southern New York and runs over the land to Florida. It is said that Linnæus named this plant for the three Commelyn brothers —

Dutch botanists — two of whom were authors, the other published nothing. The two bright blue petals represented the two brothers who did something for the world; the inconspicuous petal being for the brother who was of no use.

The Droseras, those insectivorous plants that Darwin experimented with; and the pretty Floating Heart (*Limnanthemum lacunosum*), which looks so like a small pond lily, come to us at this season. And we find — at least in one place in Massachusetts — the beautiful *Rhododendron maximum*, which grows sparingly in New England, but is very common along shaded water-courses in the mountains of Pennsylvania and southward. I saw it growing wild for the first time last year, July 16, when it was a little past its prime.

The *Cassias* — *Marilandica*, *Chamœcrista*, and *nictitans*, three interesting members of the Pulse Family, make good garden plants.

The orchids that I find in this month are *Spiranthes gracilis*, *Goodyera pubescens*, *Habenaria tridentata*, *H. lacera*, and *H. psycodes*.

The two early golden-rods, *Solidago Canadensis* and *S. juncea*, are found in the latter part of this month, as are those early Asters *A. corymbosus* and *A. macrophyllus;* and that favorite of all, the bright, cheerful looking Cardinal Flower (*Lobelia cardinalis*).

Several years ago I was told that if I should go to a town some fifty miles from Boston in the first week in August, I could find the White Fringed Orchis (*Habenaria blephariglottis*) and the Turk's-cap Lily (*Lilium superbum*), in great abundance — two flowers so beautiful that they seemed worth taking a journey of over fifty miles, to have the opportunity of gathering as many of them as I desired. So a year ago last summer I went, and had the great pleasure of seeing how and where they grew. With them were many other attractive flowers, the rarer ones being *Bartonia tenella*, *Eupatorium teucrifolium*, and *Rhexia Virginica* (Meadow Beauty).

August comes so laden with notable wild flowers that it will be hardly possible to more than mention their names. I think that the flowers of August rival those of June, mentioned by Thoreau, for I had, on August 8, 1891, the finest show of wild flowers that I have ever been able to collect at any one time. There were large bunches of the White Fringed Orchis, the

Turk's-cap Lily, Meadow Beauty, Wild Bergamot (*Monarda fistulosa*), *Cassia Marilandica*, *Coreopsis rosea*, Cardinal Flower and Golden-rod.

The Gerardias, which flower in August, are an interesting genus of plants, six of which, *G. flava*, *G. quercifolia*, *G. pedicularia*, *G. pupurea*, var. *paupercula*, *G. tenuifolia*, and *G. maritima* can be found not many miles from this city, and five Desmodiums are near neighbors to the Gerardias.

We have now the *Brasenia peltata* (Water Shield), that odd looking plant of the ponds, the submerged portions of which are covered with a mucilaginous substance transparent as glass; *Monarda fistulosa* (Wild Bergamot), *Coreopsis rosea* — which is rare north of Plymouth — four Polygalas and the beautiful *Sabbatia chloroides*, which bears transplanting, if you put it in a proper location.

Most of the Asters and Golden-rods are now in flower, for I find that on August 31, 1889, I had the blossoms of twenty-two Asters and nineteen Golden-rods. Some of them, of course, were past their prime and others just coming into flower. Many of the Asters make very satisfactory garden plants, the purple Aster, *A. Novæ Angliæ*, with its variety *roseus*, *A. spectabilis*, and *A. ericoides* being particularly good.

The Iron Weeds (*Vernonia Noveboracensis* and *V. fasciculata*), with their bright purple flowers make a fine show, and take kindly to cultivation.

The fragrant *Spiranthes cernua* is abundant in moist ground, and that odd looking orchid, Corallorhiza, which always looks to me as if it were parasitic, can be found in this month, under old pine trees.

The Closed Gentian (*Gentiana Andrewsii*) and the delicate greenish veined, white flowers of the Grass of Parnassus (*Parnassia Caroliniana*), will fittingly end this month, leaving only the Fringed Gentian (*Gentiana crinita*), Rattle-box (*Crotalaria sagittalis*), and some of the later Asters for September.

The Witch-Hazel (*Hamamelis Virginiana*) belongs to October and is the last flower of the year. Of this Thoreau says, "There is something witch-like in the appearance of the witch-hazel, which blossoms late in October and November, with its irregular angular spray, and petals like furies' hair or small ribbon streamers. Its blossoming, too, at this irregular period when other shrubs have

lost their leaves as well as blossoms, looks like witches' craft. Certainly it blooms in no garden of man's."

Wild Flowers and Ferns are so intermingled where they grow naturally, that it seems eminently proper to treat of both in the same paper.

A poet-naturalist said, "Ferns were made to show what beauty can rest in a leaf," and another charming writer of out-of-door papers said, "They are one of the triumphs of nature. Numerous in species, exquisite in form, tender in color, graceful in motion, harmless in growth, wholesome in odor, sensitive yet persistent, refined yet abundant."

You will, I think, all agree with me in saying, that this description is true to fact. What is there in nature more exquisitely beautiful and graceful than the Ferns?

The study of ferns, fascinating as it is, is often attended with many difficulties, though the helps thereto are much better than they were several years ago. I well remember the difficulties that I encountered and the long time that elapsed before I could obtain any real aid. I would take my botany and study, but the descriptive words seemed to have but little if any meaning. The plates even, as I had no named specimens to compare them with, were unsatisfactory. I finally had an opportunity to listen to a lecture by a noted Professor, and his simple, plain statements and object teaching gave me my first real knowledge of ferns. It was refreshing, after my struggle with the scientific terms, to hear him call a brake a brake, and describe the peculiar fruiting of the Pteris as a hem on the frond. These things I could understand and remember. Do not misunderstand me, and infer that I think scientific terms unnecessary, for they are all important, only it seems to me best, as I found by experience, to become familiarized with simple, general names before attempting the scientific.

Ferns, as you all know, are flowerless plants, belonging to the class called Cryptogamous. In this sub-kingdom there are several large families, among which are the mosses, horsetails, lichens, and liverworts, but the Ferns or Filices occupy the place of distinction.

Mr. George E. Davenport, one of our best authorities upon Ferns, gave you so much valuable information in his excellent paper upon the subject, read before this Society in March, 1891, that it is unnecessary for me to tell you anything about the growth

of ferns from the spores, their fruiting, and the books to be used in studying them, even if I had time, and moreover it has not been my purpose to make this paper in any way scientific, only to tell you something of some of the wild plants that have been specially interesting to me.

There are forty-two species and eight or more varieties — some of the latter being a matter of opinion among our best botanists — of ferns, that grow naturally in the state of Massachusetts. On the table at your left are herbarium specimens of these ferns which I thought some of you might like to look at.

In the forty-two species of ferns which I credit to Massachusetts I include the Grape Ferns (Botrychiums) and Adder's Tongue (Ophioglossum), which really are only Fern Allies, but are still classed with the ferns. Professor Eaton says of them, "They are not *Filices* as is now well known," but "they are closely related to them, and are certainly *Ferns* in the ordinary acceptation of the term."

In calling to mind the ferns that you have found in your walks, you will naturally first remember the spring ferns, among which are the Osmundas, or so called Flowering Ferns. These with a little study and observation are readily learned. They are among our largest northern ferns. I have found fronds of the Royal Fern (*Osmunda regalis*) and the Interrupted Fern (*O. Claytoniana*) nearly five feet in height. The Royal Fern is the only Osmunda growing in Great Britain, and is much valued in that country, where it has been known to attain the height of twelve feet, though its general growth is from six to nine feet.

It is related that one of the boatmen employed by Sir Walter Scott on his visit to Killarney, said that Sir Walter scarcely uttered a syllable in praise of the scenery, but when he came to a spot where the Royal Fern grew in abundance, he stopped the rowers and exclaimed, "This is worth coming to see!"

You will, I am sure, also be attracted by the almost feathery fronds of the Lady Fern (*Asplenium Filix-fœmina*), which you will often find by stone walls and near the edges of the swamps. This is the favorite fern of the poets. Scott thus alludes to it:

> "Where the copse is the greenest,
> Where the fountain glistens sheenest,
> Where the morning dew lies longest,
> There the Lady Fern grows strongest."

Shirley Hibberd compares it "to a plume of ostrich feathers of the most intense and delicate tint of yellowish green." The shade of green however varies much with situation and age.

Aspidium spinulosum, one of the Shield Ferns — partially evergreen — is to me one of our most beautiful ferns. It may be that the real use I can make of its beauty has much to do with its being such a favorite. If you take up a root in August or the first of September, before the autumn winds and rains have broken the stipes, you will have a fern for your parlor that will give delight to yourself and your friends for months. And when the fronds get broken, as they probably will in time, cut them off, put the fern where it will have a gentle freeze, and let it rest awhile. In the latter part of March give water, heat, and light, but not much sunshine. If the proper conditions have been observed you will have in about two weeks a fern whose delicate beauty will charm every beholder, and it will be particularly interesting to yourself, for you have watched day by day its almost magical growth.

The Ostrich Fern (*Onoclea Struthiopteris*) is, as Mr. Davenport told you, an excellent garden fern. It is also very satisfactory for house growth and experimental purposes. This fern is rare in this vicinity. I know of but three locations in Middlesex County, and only three are mentioned in the Essex County Flora.

Late one autumn an Ostrich Fern plant was sent to me by mail from Lincoln, Massachusetts. It spent the winter in a cold room, put loosely into the earth, and a little water was given at long intervals to prevent it from becoming absolutely dry. It was properly potted and brought into a warm room a little after the middle of April. On April 24, I felt certain that one of the crosiers had moved upward a little and that there was no doubt now about the life of the plant.

On May 1, the frond was twenty-one inches long, showing that it had grown nearly three inches each day. After the first week the growth was not so rapid, but there were in due time six beautiful, well developed fronds, forming a perfect vase shape. The slender stem was well defined, then a gradual curve outward of rare symmetry, until the broadened fronds bent over their tips for the rounded edge. Later, one fertile frond was developed in the centre, but if the plant had remained in its own home there probably would have been more.

In writing to a botanical friend about it, I said, "I am curious to learn how long I can keep the fronds bright and green. Will they know when the time for the sere and yellow leaf comes, and droop and decay just the same as when out of doors? Time, I suppose, will answer me if I patiently wait."

And this I wrote as the result:

"Perhaps you may remember that I was experimenting with an Ostrich Fern last year, hoping to induce it to retain its dress of green until the end of the autumn months at least. But when Miss Ostrich found that her sisters, aunts, and cousins were donning suits of russet brown, she was very desirous of following the fashion. And when I remonstrated and told her that although the brown was a handsome color, it was not durable — that the dress would soon be ragged, torn and faded, she would sigh and put on such an unhappy look I knew that she would take advantage of the first opportunity to dress like the rest of the world, and she did. She held up her head two or three weeks longer than her out-of-door relatives, but the fatal dress brought her to grief about the middle of October, when she went to join the great majority."

I have here a dried frond of what Professor D. C. Eaton says is "the largest of all the ferns of the United States," *Acrostichum aureum*. It is often from eight to eleven feet high, and its United States habitat is Florida. It is perhaps the only known fern which grows only within the influence of salt water. It is found as far as the water is brackish and ceases as soon as the water becomes entirely free from salt. I have sent four times to Florida for a living plant; three attempts have failed but I expect another plant soon which I hope will grow. This specimen was brought to me from the Island of Jamaica. You will find an herbarium specimen on the table which was gathered in or near Rio Janeiro.

This growing fern, *Scolopendrium vulgare* (Hart's Tongue), is among the rarest of the American ferns, but is a common plant in Europe.

I specially recommend our native ferns for garden culture, for I have many times seen them most successfully grown.

This I quote from a letter giving some description of a wild garden: "I wish you could see two most luxuriant and graceful clumps of maiden-hair fern — one growing against the front wall of this old brick house, with fronds all leaning outward, and a

very thick patch in the open garden, fronds growing all round. Every one recognizes their marvellous beauty."

It has been most truly said by a writer about plants, that "Learning the name of a plant is only our introduction to it. We should never cease to study their habits, their modes of growth, and the uses of every organ in root, stem, and leaf."

"Flower in the crannied wall,
I pluck you out of the crannies,
Hold you here, root and all, in my hand,
Little flower; but if I could understand
What you are, root and all, and all in all,
I should know what God and man is."

All other books pale before the ever varying Book of Nature. There is no end to the entertainment, if you look no higher than this, that is afforded without money and without price to any who have a little leisure. Without price? Perhaps not, for whatever is of real worth must be paid for in some way, and to reap a good harvest from Nature you must sow earnest seekings well mixed with enthusiasm, and then you will be repaid a hundred-fold.

Discussion.

E. H. Hitchings said:

The Committee on Discussion have asked me to say something at this time, so I will give you a few reminiscences, mainly connected with the Middlesex Fells. I have been familiar with them from childhood. Seventy-seven years ago, when I was about eight years old — as nearly as I can recollect — I picked the White Huckleberries, in Malden. About fifty years later I went to the same place and found them still growing there, and apparently on the same bushes, which looked as if they might be fifty years old or more. I picked them and had them on exhibition here in my collection of native plants. All the common flowers that grow near Boston, may be found in the Fells, and also some of the rarer ones.

But what interested me as much as anything I learned there was the fact that the wild flowers, even in this cold region, blossom every month in the year. I have spoken of this before, and you will excuse me for speaking of it again today, as I want to introduce a fact in this connection, which I think will be new

to most of you. When I spoke on this subject before I said substantially: "To those who are not accustomed to observe carefully, the vegetable world, for four months in the year, appears to be in a state of rest. But Nature knows no rest. There are no Sundays in her calendar. She works every day in winter as well as summer."

I then gave you the dates showing that flowers had been collected twenty months in succession, and also that I had found the Hepatica in flower from September to May inclusive — nine months. November 30, 1890, I found three plants in flower in Stoneham, a blue one, a dark purple one, and a large plant with white flowers and a large number of buds. December 12, two of the plants were still in flower, the purple one and the large white one. Lowell in writing of these early flowers says:

> "I, country-born an' bred, know where to find
> Some blooms thet make the season suit the mind,
> An' seem to metch the doubtin' bluebird's notes,—
> Half-vent 'rin' liverworts in furry coats,
> Bloodroots, whose rolled-up leaves ef you oncurl,
> Each on 'em 's cradle to a baby-pearl,—
> But these are jes' Spring's pickets; sure ez sin,
> The rebble frosts 'll try to drive 'em in."

But the Hepatica, or Liverwort as Lowell calls it, does not seem to mind the frost. Here they are in flower in December, with the ground frozen so hard that you could not dig up one of the plants.

I did not go into the woods again until March 10, 1891. Then the large white-flowered plant was still in blossom, the petals of the earlier flowers lying on the ground and a single bud left. George Herbert wrote, nearly three hundred years ago, "God's Mill grinds slow but sure." Here is a good illustration of it — a single plant growing and blossoming from November 30 to March 10. A plant in May usually keeps in flower about a week. But these are not the only plants that bloom in winter. The Early Buttercup, the Chickweed, the Shepherds'-purse, the Alder, and Willow and others have been found.

Let me quote you a few lines from R. W. Emerson: "If I go into the woods in winter, and am shown the thirteen or fourteen species of willow that grow in Massachusetts, I learn that they quietly expand in the warmer days, or when nobody is looking at

them, and though insignificant enough in the general barrenness of the forest, yet a great change takes place in them between fall and spring; in the first relentings of March they hasten, and long before anything else is ready, these osiers hang out their joyful flowers in contrast to all the woods. . . They bend all day to every wind; the cart-wheel in the road may crush them; every passenger may strike off a twig with his cane; every boy cuts them for a whistle; the cow, the rabbit, the insect, bite the sweet and tender bark; yet, in spite of accident and enemy, their gentle persistency lives, when the oak is shattered by the storm, and grows in the night and snow and cold. When I see in these brave plants this vigor and immortality in weakness, I find a sudden relief and pleasure in observing the mighty law of vegetation, and think it more grateful and health-giving than any news I am likely to find of man in the journals, and better than Washington politics."

Later in the season, when the Hepatica is in perfection, there is a pine grove in Stoneham where you may get them by the thousand, of nine or ten shades of blue, purple, pink, and pure white. But the dark purple ones, with their yellow anthers in contrast with the petals, are my favorites.

Still later in the season, not far from this grove, is a little brook, winding through the meadow among the alders and willows, where — about the middle of June — you may find the *Ranunculus aquatilis*, L., var. *trichophyllus*, Gray (White Buttercup), filling the brook and making it perfectly white. Further up in the Fells, is a small pond full of *Ranunculus multifidus* (Yellow Water-Crowfoot).

But the rarest of all the Buttercups found in this vicinity, is the *Ranunculus Flammula*, var. *reptans*. The nearest place for this that I know, is on the banks of a stream about twelve miles from Boston.

About a mile this side of the stream, in a beautiful white pine grove, carpeted with *Mitchella repens*, in full bloom, filling the air with fragrance, I once saw six plants of *Habenaria orbiculata*, each of them with their two large, round, shining leaves lying flat on the ground, and a scape fifteen inches high, with flowers almost as white as snow. It was a sight worth walking miles to see. I took a single plant and pressed it, and have it here now, with specimens of all the Orchids that grow in this vicinity, which I shall be glad to show you.

Not far from this grove is a bit of meadow, about half as large as this room, full of *Menyanthes trifoliata* (Buckbean), *Eriophorum alpinum* (Small Cotton Grass), and *Parnassia Caroliniana* (Grass of Parnassus).

Another place which ought not to be omitted when speaking of the Fells, is Winter Pond in Winchester. Here you may find three very rare plants, *Echinodorus parvulus*, *Scirpus supinus*, var. *Hallii*, and *Eleocharis Engelmanni*, var. *detonsa*. The *Coreopsis rosea* also grows here. In the last edition of the Manual, Professor Watson made an error in copying Dr. Gray's remarks on these plants in the "Botanical Gazette." Professor Watson says, *E. obtusa*; Dr. Gray wrote *E. Engelmanni*, Steud., var. *detonsa*, Gray. See "Botanical Gazette," October, 1878, article, "Some Western Plants."

Mrs. Richards said something about an old botanist finding the Yellow Lady's Slipper. Now I don't make any pretension to being either old or a botanist. To be a botanist requires a long life of hard study, and I have had to work for a living ever since I left school, and have had only the leisure hours, when there was no work. In regard to old age, I don't believe in Daniel Webster's theory. At a dinner of the Webster Historical Society, an anecdote was told, in which he was reported as saying to a young lady, "If you live to be fifty years old, you will find that there is nothing new to learn, nothing new to lose, nothing new to live for."

I think Longfellow took a more rational view. In a letter to a friend he writes, "To those who ask how it is that I write so many things that sound as if I were still a young boy, please say, there is a pear tree in the neighborhood or neighboring town, planted by Governor Endicott two hundred years ago; it still bears fruit not to be distinguished in flavor from that of the young tree; it makes new wood every year so that some part of it is always young. Perhaps that may be the case with some men as they grow old; I hope it is so with me."

I did find the Yellow Lady's Slipper. I had been looking for it nine or ten years. I knew it had been found in a large swamp about twelve miles from Boston. On the 25th of May, 1879, I invited a friend to go out with me. In the cars we met two brothers who had been looking for the flower as long as I had. Soon after we got to the swamp we found the pink azalea in

flower. Later we found the *Habenaria orbiculata* — not in blossom — and other interesting plants. About noon the older brother said, "well, C. if we expect to get home to dinner, it is about time to start; we will leave Hitchings to find the Yellow Lady's Slipper." After eating our dinner in a pleasanter place than any room I ever dined in, I said to my friend, "We have plenty of time, I will look into the swamp once more and see what I can find." In a few minutes I found thirty plants of the Yellow Lady's Slipper, all in flower, one of them with two blossoms on the stem. The next day when I came home to dinner, I found a letter from one of the brothers saying they found it a few minutes after leaving us.

We sometimes have a surprise, not so pleasant as this was. I had one last year. Three or four years ago I found the *Pentstemon pubescens* growing wild, on a rough, gravelly ridge covered with bushes, in Melrose. Two years ago I found the *Liparis Lœselii* about a stone's throw from the same place, growing in a meadow, with the Arethusa, Pogonia, Calopogon, Ophioglossum, and other interesting plants. Last year I went there, and the owner had dug away the ridge, Pentstemons, bushes, and all, and carted them into the meadow. Well, I suppose he will get a good crop of hay there sometime, but I don't think he will enjoy it half as much as I have the flowers. I have spoken about my first "find;" now a few words about my last one. July 31, 1891, I found a very rare plant in fruit. June 5, 1892, it was in flower.

Now I want to say a word or two about the names of plants. Suppose I should tell you that my rare plant was the Cancer-root (the common name), nine-tenths of this audience could probably say, "Oh, I found the Cancer-root years ago." But when I give you the botanical name *Conopholis Americana* and show you this photograph of the plant, you see at once the necessity of using the scientific name. When I saw the plant in flower, I could not help recalling Tennyson's remarkable lines, which Mrs. Richards has quoted:

> "Flower in the crannied wall,
> I pluck you out of the crannies,
> Hold you here, root and all, in my hand,
> Little flower; but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is!"

The plant is a parasite; having no root of its own, it has to borrow the root of an oak on which to grow. There is no description in the Manual, or any book that I can find of the attachment of this plant to the root of the oak, but you will see it in this photograph, and also rudiments of new plants for a year or two to come. I have a root here which shows the rudiments for five or six years.

Mr. President, there is no end to this subject, so I will close by quoting the last verse of Horace Smith's Hymn to the Flowers.

> "Were I, O God! in churchless lands remaining,
> Far from all voice of teachers or divines,
> My soul would find in flowers of thy ordaining
> Priests, sermons, shrines."

Mr. Hitchings exhibited herbarium specimens of fifty species of native orchids.

Felker L. Temple had been much interested in the essay, and wished to add a few words from his experience. About six or eight years ago he was riding upon a driveway in the wooded country near Lake Winnepesaukee, about the middle of August, when he observed a quite long branch of witch hazel in full bloom. It was so unusual a sight at that season that he stopped and examined the tree, and found that the branch had been much twisted, in fact, so much as to nearly stop the flow of sap. He was led to believe that the blooming was hastened by the exhaustion or scanty supply of sap in the branch, which would naturally be the condition at the usual time of flowering, in October or November. Several other branches, also more or less in flower, were found to be twisted in the same manner, but to different degrees.

Mr. Temple then spoke of an interesting find among the native asters. In the autumn of 1892, he and a friend found six individual plants of what seemed to be *Aster dumosus* with entirely double blossoms. These double flowers were, in one plant, about three-fourths of an inch in diameter, and in the other five from an inch and a quarter to an inch and a half in diameter.

Several other plants were also found with semi-double flowers, all of which plants have been planted out to preserve them, and it is hoped to exhibit the flowers at Horticultural Hall, in August, 1893.

Thomas Harrison spoke of the plentiful growth of Garget (*Phytolacca decandra*) in the vicinity of Stoneham and Melrose

Highlands, particularly in places where the upper surface of the soil has been removed. He admired this plant for its beautiful foliage, which he considered as striking and effective as that of either cannas or thriftily growing dahlias.

Charles W. Jenks moved a vote of thanks to Mrs. Richards for her very interesting paper, which was unanimously passed.

Thomas Harrison then moved a vote of thanks to Mr. Hitchings for the highly interesting botanical reminiscences he had given, which was also unanimously adopted.

President Kidder announced for the next Saturday, a paper upon "Carnations and Their Culture," by Richard T. Lombard, of Wayland.

BUSINESS MEETING.

SATURDAY, February 25, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER in the chair.

No business being brought before the meeting it

Adjourned to Saturday, March 4.

MEETING FOR DISCUSSION.

THE CARNATION AND ITS CULTURE.

By RICHARD T. LOMBARD, Wayland.

The Carnation, by reason of its real merit, has since 1860 rapidly forced itself into an important place in the flower trade of the northern and central parts of our country.

Nearly four thousand florists are engaged, either wholly or in part, in growing this plant for cut flowers; and it is estimated that last year fully two hundred million blooms were sold, yielding over a million of dollars to the growers.

Its variety of color, fragrance, beauty of form, and keeping quality, have made it a decided favorite, and it may justly be styled the "Flower for the multitude."

A flower of so much importance in trade, and one so generally loved, is certainly of sufficient importance for us to give it careful study.

The subject would seem to divide itself into three parts.

First: — Its history.
Second: — Its garden culture.
Third: — Its cultivation under glass.

Its History.— The wild species from which our cultivated varieties were derived is *Dianthus Caryophyllus*,— Dianthus, from *dios*, divine; *anthos*, flower; thus we have the "Divine Flower," a term generally given it and by which it is so well known. This species was called *Caryophyllus*, a designation evidently given on account of the clove fragrance of the flower. At the time of its introduction into England its prevailing color was a very light shade of pink, or more properly "flesh color," and from this fact it received its name of "Carnation." There is no doubt that under the influence of English soil, climate, and culture, its color became darker, and we find a few years later it was called "Pink."

The wild carnation was single, having but five petals, and its native habitat was extremely limited, being found only in parts of France, Italy, Austria, and in the northwest part of India; and always upon high, well drained land, where limestone was found. It has never been known to thrive in its wild state except near the habitation of man. The general construction of the plant and the character of its foliage is such that it withstands drought wonderfully, and recovers from it rapidly when water is supplied.

From one or more of the places named — but more probably from Italy — the wild variety has been naturalized in various countries, more particularly in England; but wherever naturalized as a wild plant it has only succeeded in limestone districts or near old buildings on well drained soil. As we know the plant it clearly shows the climatic influence of Southern Europe.

Its peculiarities are such that under cultivation it has taken almost any character, as to color or form of flower, which the careful cultivator has desired. It has been popular in one generation and unpopular in the next. When it was in favor the flowers were increased in size and the varieties were numbered by hundreds; and when the "carnation fever" abated, it quickly lapsed to its ordinary size and the varieties were few.

At one time the fringed petals were sought for and obtained; and at another, smooth edged or "rose leaved" petals were wanted, and this desire was gratified. The gardeners of two hundred years ago thought the flower imperfect if it did not split its calyx, and on refractory flowers the knife was used on the calyx that did not burst. But for the last hundred and fifty years great effort and care have been taken to prevent the bursting of the calyx, which to this time has not been wholly successful.

Pliny refers to the carnation as having been used in the days of Augustus Cæsar, to give a spicy flavor to wine. While greatly loved and admired by the ancients, its improvement was not undertaken to any great extent until it found a home in England.

It is not quite clear when it was introduced into England; probably as early as the year 1200.

Chaucer wrote of its cultivation in 1386, from which time it has always been considered as a florist's flower.

It was first called "Carnation" by Henry Lyte in 1578, and designated as "Pink" about the year 1600.

Edmund Spenser called it "Coronation," but this name never found common use.

Shakespeare, in "The Winter's Tale," Act IV, says, "The fairest flowers o' the season are our carnations." He also alludes to it in "Henry V."

It is well settled that as early as 1655 there were more than one hundred varieties, all of them "fair, large, and double flowers." In recent years there have been as many as one thousand varieties, each with an individual character, as color, habit, vigor, marking, whether early or late, etc.

One of the early cultivators says, "It calls forth our admiration, ministering to our delights, and gladdening the hearts of the children of men." As early as 1665 there was a large variety and as to color, we find white, various shades of pink, scarlet, crimson, and yellow for selfs; also a great number of fancy marked.

Professor L. H. Bailey, of Cornell University, has stated, "that in all probability the original color of the carnation was light, sky-blue and without fragrance." I have not found that the early writers allude to "blue" as a color of the carnation, or that any blue flowers have been known since it has been cultivated; yet the opinion of so high an authority should have great weight.

But as to fragrance, I must differ from him, for certainly the evidence is quite conclusive that, except for its fragrance, it would have remained to the end of time, the small, plain, five petalled, wild flower of its native land.

Its well known habit of "sporting" from seed has not changed for four hundred years at least, and the uncertainty of this manner of growing makes the business of raising seedlings very fascinating, as each opening bud has a charm of its own.

In 1675 John Rea, of England, had three hundred and sixty varieties, the flowers all double and measuring from two to three inches across.

The first yellow carnation was brought to England, from Poland, in 1590, and was grown extensively in the seventeenth century. It was very popular with all who grew flowers. It is evident that the cultivators of Poland, at that time, were fully as far advanced in gardening art as those of England.

This brief history would be quite incomplete, without stating that near the end of the seventeenth century, a gentleman by the name of Fairchild, living at Hoxton, England, produced a hybrid carnation between *Dianthus Caryophyllus* and *Dianthus barbatus*, and Dr. Maxwell T. Masters says, "it was not only the first hybrid carnation ever raised, but actually the first artificial hybrid *of any kind* on record."

From the earliest cultivation of the carnation to about 1810, it was entirely grown from seed or propagated by layers. At this time a new system was begun, the propagation by cuttings; the only difference in this work, between then and now, is that they obtained bottom heat by the same method we use in preparing our hot-beds, while we use steam or hot water pipes or a flue.

About 1840 the improvement of the carnation was begun in France, and actively carried on by M. Schmitt, of Lyons; and a few years later by Alphonse Alegatière, they following the same line of work so well begun by Fairchild, and with advantages to aid them of which Fairchild could not have dreamed in his time.

M. Jean Sisley made the assertion that Alegatière "created a new species." My reply to him is, that this is simply an error, for no power less than the fiat of the Deity can create a new species of any kind, for it is a well settled law that "a species may be modified by external influences, and thus give rise to races

or varieties; but it never abandons its own proper character to assume another."

The fact is that the seed of long past ages contained the latent power which, for more than six hundred years, by culture, selection, hybridization, and crossing, has marched onward and upward in development, by the well established law of evolution, until we have the perpetual varieties of today. And this development has been brought about by the careful and intelligent labor of such men as Fairchild, Hogg, and Dodwell in England; Schmitt and Alegatière, in France; and Sewall Fisher, Charles T. Starr, and others, in America,— all have contributed to the result, and the credit is not due to any one in particular, but each is entitled to a share of the honor.

The first Carnation Society was formed, and the first exhibition of the flower (as a separate exhibition) took place in England, July 25, 1850.

I have been unable to find who first grew, or at what date the first carnations were grown, in this country; they were probably grown here before the present century, for at an exhibition held by the Massachusetts Horticultural Society, August 1, 1829, a seedling carnation was shown; again on June 10, 1830, David Haggerston and the Messrs. Winship exhibited "fine carnations," and at one of the weekly exhibitions of this Society, held the same year, "one hundred different varieties of carnations were exhibited," which was a much larger number than has been shown in recent years. These were evidently the half-hardy sorts, which were wintered in cold frames. We can well imagine with what pride and satisfaction the pioneers of this grand old Society, gathered about the tables to admire the beauty and enjoy the fragrance of such a worthy display; it is quite possible that President Dearborn, Daniel Webster, Harrison Gray Otis, John Lowell, and many other notables were among those present.

In 1831 this Society offered a prize of three dollars, for the best pot of carnations.

Between 1860 and 1870 floriculture took a great start around Boston, and between these dates it is believed that importations of carnation plants were made, chiefly from France. It may have been a few years later, as I have been unable to find any data by which to fix the exact time. These importations were of the varieties called "Perpetual," and from the time of their introduc-

tion, the old half-hardy varieties seem to have almost disappeared. The first varieties to come were, La Purité and Edwardsi, and a little later President Degrauw and Crimson King; these were the foundation of those now grown.

With us, from that time, the interest in the carnation has been on the increase, and on October 15, 1891, the American Carnation Society was formed in Philadelphia.

New varieties are grown from seed, and the chances of getting one equal to or better than the parents is as one to five hundred.

I am convinced that no advance can be made without taking the best types for parents and giving them the best possible conditions. Very rarely can a good one be obtained by chance, for, as a rule, in this as in everything else, hereditary influence and environment will impress the new plant, and if you seek success these must not be disregarded.

Carnations grown under ordinary treatment, and with an unsplit calyx, have for more than four hundred years varied but little in size — from one and one-half to two and one-half inches in diameter. In England they have had flowers four inches across, but this was the flattened flower resulting from the split calyx. We have at the present time a few varieties which will, under high culture, and by disbudding and forcing, produce a few flowers from three to three and one-quarter inches in diameter.

I know of a few persons who assert, with seeming confidence, that we are to have a variety that will give us flowers not less than four inches in diameter, with stems as strong as common lead pencils, and not less than eighteen inches long, with foliage eight inches long and one-half an inch wide.

In this progressive age it will not do to say, "this cannot be done," for the seeming impossible of today is, on the morrow, not only possible but the fact. While I do not say that this point will not be attained, yet the whole history of the plant would seem to preclude a flower of such a type under any such treatment as is now given by the best growers.

My idea of a first-class flower is this, — It should be symmetrically formed; its petals fringed or serrated and of good substance; if a self, the color evenly distributed throughout its petals; its calyx non-bursting; it should be fragrant; its centre full, well raised, yet not crowded; and should measure from two to three inches across; the whole flower giving a pleasing effect to

the eye. Any flower whose petals grow well above the calyx before expanding, is not likely to burst the calyx.

The plant should be vigorous, strong, healthy, freely branching from two to three inches above the soil; foliage of a rich blue-green and not over one-fourth of an inch in width; flower stems well branched, giving a stem to each flower from eight to twelve inches long, and with sufficient strength to hold the flowers erect.

The carnation will succeed in any ordinary soil, from light sandy loam to a firm clay. It prefers a fairly rich loamy soil—well rotted turf with one-fourth its bulk of old manure, with a bushel of air-slaked lime and a bushel of hard wood ashes to every two loads of soil.

Different varieties require different soil; as a rule give the plant the same soil in which the parent plant was first grown. If a variety originated in a heavy soil and succeeded in such soil, the chances are that it found a congenial condition as to soil, and would ordinarily do best in soil of a like character; likewise, if the parent plant grew in a sandy loam and succeeded, it would be more likely to do best in such soil.

It is well settled among growers that few if any varieties do well in every place where carnations are grown; therefore, in selecting stock, take those which originated in a soil similar to that you have.

It has been said that the State of Pennsylvania has what is called a "Carnation belt," a spot of earth made expressly for this plant. I am free to admit that Pennsylvania has a great number of the special bounties of creation, for which the people of the other states are compelled to pay heavy tribute, if they desire to use them; but that it is favored with a soil or climate particularly suited for the carnation is simply a myth. To show the correctness of my position, I need only to remind you that whenever her growers have exhibited flowers in competition with those of other parts of the country, or sent plants grown within her borders to other States, the outside growers have not found anything to fear, in their competition with this, so called, favored locality, either as to flowers, plants, or new varieties.

For myself I believe in New England and her institutions. I venerate her "granite hills" and love her "rock bound coast." I honor her sons and daughters who have exhibited in this hall as fine flowers, fruits, and vegetables, produced from her rugged soil,

as can be grown north of the thirty-ninth degree of latitude, and we can all sing with Whittier:

> "But scarce would Ceylon's breath of flowers be sweet,
> Could I not feel thy soil, New England, at my feet!"

Garden Culture.— That the carnation is not more generally grown in our gardens, for summer flowering, is quite surprising, when we consider the ease with which it can be grown, and the abundance of fragrant, lasting flowers, of such varied colors. It surely ought to give more pleasure than the sub-tropical weeds which have so little to commend them; at least we should not discard the plants of our own latitude for less desirable ones from the tropics.

To have plants for summer flowering, they should be propagated in October or November, put in flats or thumb-pots, and kept in a cool house until March 1; then they should be repotted in three and one-half inch pots and have plenty of sunlight and air. Put them in cold frames about April 1, and plant in the garden from April 25 to May 10. They should be pinched back only once—about March 1.

Treated in this manner they will commence to flower in June and give a constant supply until November. In 1891 I gathered from two thousand plants an average of forty flowers per plant, and cut five hundred perfect blooms on the fifth of November. Last season was less favorable, and I did not have good flowers later than October 15.

But we want something more than this; we need the hardy and half-hardy varieties that are so plentiful in England, France, and Germany, and which were very generally grown about Boston forty years ago. They were grown both in pots and in gardens. Their cultivation is very simple; in fact the same as the Sweet Williams, if grown from seed, or they can be grown from cuttings, and protected during winter by frames. I sincerely hope they will be grown here again within a few years, at least as freely as the Sweet Williams.

Cultivation Under Glass.— Nature's method of increase is by seed, but this has proved so uncertain and slow with the carnation, that the wisdom of man has devised a way to multiply by cuttings. We can thus rapidly increase such varieties as are found best suited to our needs; by this means we retain the same

characteristics, whether they are desirable or not. But while the cutting takes a separate existence, it seems that when this method is carried on year after year the process of deterioration goes on also, until the vital force of the variety becomes so much impaired and weakened that it ceases to have sufficient strength to maintain its existence and continue profitable to the grower. Whenever man supersedes Nature's course we find more difficulties to surmount.

A cutting is a small side-shoot, which grows from a joint of the flower stem. It should be taken off when about three inches long, and the end cut smooth. The most favorable time to root them is from January 1 to March 1.

The propagating bench should be on the north side of the greenhouse, shaded from the direct rays of sunlight, and free from all draughts of air. Put in the bench clean, sweet sand three inches deep, and with a brick press the sand very firm, which will reduce it to about two inches in depth; then with a trowel cut into the sand about one inch deep. In these channels insert the cuttings, one-half inch in depth and one-half inch apart; the rows should be from one to two inches apart. Press the sand about the cuttings and water thoroughly, and afterwards water as often as may be necessary to keep the sand moist, but not soggy. In a house with an average temperature of 50° and with bottom heat from 60° to 65° the cuttings will root in about forty days, and the loss, with most varieties, should not exceed five per cent.

The cuttings, when rooted, may be potted in thumb pots, or put in "flats," and placed in a house of 55° at night, and 65° during the day, being shaded the first few days. After they have become established, put them in a much cooler house, where they may have a period of rest until put in cold frames early in April. Plant them in the field — from ten to fifteen inches apart — from April 25 to May 15. If properly hardened in cold frames they will not be injured by frost, even if the ground should freeze an inch in depth. They should be pinched back as often as required until July 1 or August 15, according to the season and the variety. Conditions having been favorable, the plants should by September 15 be large and stocky, and ready to put in the greenhouse.

The soil — compounded of materials as before named — should be prepared in the spring, and well worked over. Just before

lifting the plants, put the soil in the benches not less than five nor more than seven inches deep. If solid beds are used the soil should be six inches deep. When ready to remove the plants to the greenhouse, select a time when both plants and ground are as dry as possible.

Lifting plants should never be undertaken when the soil and plants are wet. If the plants are thirsty when taken up, they will be sure to take water as soon as water is given, after being put into the bench.

It is important to remember that no matter how fine the varieties, or how vigorous and healthy the plants, success will, in a great measure, depend on the manner of lifting and planting, and their treatment for the sixty days following their transfer to the greenhouse.

They can be lifted with either spade or fork, saving all the roots possible, and carefully removing all the soil you can without breaking the roots. I have had the best results when the ground was so dry that all the soil would fall from the roots and leave them almost as clean as the tops, but all the roots were thereby saved.

Plant them in the bench from six to twelve inches apart according to variety; they must not be planted any deeper than they were in the field; if they are they will surely rot off just at the surface of the ground. Many carnations are supposed to be diseased when they rot off, when in fact the trouble is simply mismanagement and nothing more.

After the plants are set, the soil should be well wet from top to bottom, and not watered again until it shows indications of becoming dry. Syringe the plants several times a day, when the sun shines, until they are established. A slight shading of clay and water thrown on the glass may be necessary for a week or two. All doors and ventilators should be kept open constantly until compelled to close them on account of frost, and even after fires are started, the ventilators should be kept open both day and night, for a time at least. If, before fires are permanently started for the winter, a cold rain should come on, and continue for several days, do not fail to start a fire, for by doing so you will, in all probability, save your plants from the disease called "spot," as this disease is brought on by such conditions as a long cold storm and a wet soil.

The plants should never be watered unless the soil is dry, but they love and should always have a humid atmosphere, and this can be obtained by keeping the walks, and the ground under the benches, wet.

For the best results, give them a night temperature of from 50° to 55°, and from 65° to 75° during the day, with humidity from 70 to 74 per cent, and abundance of air whenever practicable.

Most varieties require to be staked and tied, or to have some other means taken to keep them up from the soil, so that air can better circulate about the base of the plants, causing them to dry off more readily after being watered.

From December 1 to March 1, avoid, so far as possible, wetting the foliage, or so late in the day that it will not dry before night. In warm weather, when ventilators and doors can remain open, to syringe at night is beneficial.

Liquid manure should be given as often as once a month after January 1, and the houses should be shaded about April 1. Under this treatment they ought to give a constant supply of flowers from October to August.

The carnation should not be overfed nor grown in a high temperature, for if this is done its constitution becomes impaired and disease quickly makes its appearance.

The insect enemies of the carnation are few; a weekly fumigation with tobacco, and humidity at 74 per cent, will prevent their appearance; where red spider can live, the carnation has not a congenial home.

As to its diseases I can only say the "Spot," if it appears, will depart when the conditions on which it lives are removed.

The disease called "Rust," while new with us, is quite generally found at present. As yet we know but little of it; my observation is that, while it is troublesome and annoying, it can readily be kept under control.

Other than these, there is no disease which has come under my notice, except the general loss of vitality in certain old varieties, due to conditions which I have previously stated, and which might properly be called "old age."

I have thus given you the history of the carnation from the earliest known record to the present time, and the manner of its culture derived from the combined experience of the best growers. I am well aware I have left unsaid much that is important, yet it would

be quite impossible to go further into detail in the time at my disposal, and in closing I cannot say anything better for the carnation than did Thomas Hogg, as follows: — "Of all the flowers that adorn the garden, whether they charm the eye by their beauty, or regale the sense of smell by their fragrance, the carnation may be justly said to hold the first rank."

Discussion.

William H. Spooner requested Mr. Lombard to name his choice of the best six varieties of carnations at this time.

Mr. Lombard, after referring to the great variety of opinion that exists upon that point, named Silver Spray, white; Buttercup, yellow; Grace Wilder, pink; Hector, scarlet; Ferdinand Mangold, crimson, and J. J. Harrison, variegated. More growers succeed with these varieties than with any others, while many growers would not consider some of them first-class.

A lady inquired as to the value of ashes in soil for carnations.

Mr. Lombard replied that he had found the following formula best adapted to growing these plants: He cut, and placed on the ground, a layer of good sod or turf, face down; upon that a layer of hard wood ashes; over that course he put a layer of well-rotted horse manure, and lastly a layer of air-slaked lime. The proportions of the materials are three parts sods, one part of manure, and one-fiftieth part of ashes and lime, one-half each. If the turf is from a clayey soil, use horse manure; if from a light sandy soil, use cow manure. The whole history of the carnation shows that it is fond of lime; this is a very important point. Wood ashes are good for everything in vegetation. With the exception of Buttercup and Fred Creighton, which succeed in heavy soils, all varieties of carnations now grown prefer a rather light, but rich soil.

Lucius H. Foster inquired whether the essayist anticipated an advance in the price of carnation flowers, with the possible increase in size and quality. They have been selling at one dollar per hundred; will they not bring from eight dollars to fifteen dollars per hundred in coming time, as has been the case in regard to the chrysanthemum?

Mr. Lombard believed there would always be a limited demand for the largest flowers produced, and that the price for them might

range from ten to fifteen dollars per hundred; but the greater demand would be for flowers of three inches and less diameter. Perhaps one-fourth of the crop might be from three and one-fourth, to four inches across.

Mr. Foster asked whether it is probable that the greatly enlarged flowers will be of as good quality in other respects as are the best flowers of today?

Mr. Lombard said he thought the tendency was to produce large flowers with long stems, but that to gain those points, other qualities, such as number of flowers, fragrance, delicacy of color, etc., must be sacrificed to size, just as in the chrysanthemum. Still he believed improvement would go on, and that in time we may have large flowers that are perfect otherwise, but it will take a long time.

Mrs. E. M. Gill asked whether the lecturer ever used soot or salt in his carnation soil.

Mr. Lombard replied that he had not used soot, but had used about two quarts of salt in a load of loam, or mixed soil, with good effect.

Mr. Foster asked whether lime was used as a fertilizer, or only to make the soil sweet.

Mr. Lombard had used air-slaked lime to keep soil sweet, but lime is an important ingredient in soil for carnations, not only as plant food, but in its effect on other elements in the soil.

A gardener asked for information about sea sand for the cutting bench.

Mr. Lombard did not consider that any one kind of sand afforded special advantages. It should be sweet — that is the important point; he had tried many kinds of sand, from different localities. Beach sand should be thoroughly washed; so with most other kinds. He preferred sand from a place which was exposed to the sunshine. For the cutting bench, Thomas Hogg used sand and loam, half and half, successfully. The speaker has a young man who secured eighty per cent of cuttings from using all loam. He regarded both salt and lime as beneficial to carnation plants.

Joseph H. Woodford suggested in preparing cuttings for the bench, after cutting square across just below a joint, cutting a slit upwards, about half-way or more through the joint. In his experience he had found the loss was less than one per cent; an important consideration when handling choice varieties. Mr.

Woodford added that the carnation is an excellent plant for an outside window garden. When in Northern Italy, he noticed they were used in that way very freely and with beautiful effect.

Mr. Lombard agreed with Mr. Woodford's views, and proposed that this Society offer liberal premiums for half hardy varieties for the purpose last mentioned.

Mr. Foster wished to learn whether the essayist's opinion had changed in regard to lifting carnation plants dry.

Mr. Lombard stated that long ago he thought it necessary to keep a ball of earth on each plant. But three years ago he received a lot of three hundred plants, which were sent without earth. On opening them they began to wilt, and he feared that he should lose all of them. He threw some soil over the roots, proceeded to plant them, and then watered them thoroughly. The result was he lost none. The next year he tried the dry-lifting plan on one-half of six thousand plants, with satisfactory results. Last year all of his winter flowering stock, except the Puritan variety, were thus treated; among them were twenty-eight hundred plants of Mrs. Fisher, of which up to the present time he had lost only three plants. With proper care in handling the plants during the transfer from the ground to the winter benches or borders, there is no good reason why every plant should not live. If the roots are saved in lifting there is no risk.

Mr. Foster asked whether the plants are staked and tied up before they are brought into the house, and before they are watered.

Mr. Lombard replied that the plants are tied up as soon as set, except a few varieties, like Tidal Wave; and as soon as a space of about four by six feet is filled, it is thoroughly wet down. The plants being taken up dry and set at once, are thirsty, and take up water readily; they start to grow immediately and are soon in flower.

Hon. John D. Lyman, of Exeter, N. H., mentioned tree-mould and soot, and asked if they were valuable as fertilizers.

Mr. Lombard said that if vegetable matter rotted or was burned the process was very similar, but rotted wood has not the quality of ashes, although it has a value, because all decayed vegetable matter is a fertilizer, but rotted wood is very poor compared with decomposed leaves. He had never used soot as a fertilizer, as he could not get it in sufficient quantity to test it.

Mr. Woodford asked about overhead watering for carnations growing in the greenhouse.

Mr. Lombard replied that from the first of December to the first of March, no water should be applied to the foliage; but at all other seasons, when the ventilators can be left open, and especially in warm weather, carnations enjoy overhead watering.

On motion of O. B. Hadwen, seconded by Leverett M. Chase, a vote of thanks to Mr. Lombard, for his interesting and instructive lecture, was unanimously carried.

Mr. Hadwen, as Chairman of the Committee on Discussion, announced for the next Saturday, a paper upon "Poisonous Plants," by Professor William P. Brooks, of the Massachusetts Agricultural College, Amherst.

BUSINESS MEETING.

SATURDAY, March 4, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

No business being brought before the meeting it

Adjourned to Saturday, March 11.

MEETING FOR DISCUSSION.

POISONOUS PLANTS.

By WILLIAM P. BROOKS, Professor of Agriculture, Massachusetts Agricultural College, Amherst.

The subject upon which I am to speak is one of a very comprehensive character, if treated in the broadest manner. An exhaustive monograph upon the subject, however, it is not my purpose to attempt. Such a treatment would require an amount of research and time which it has been beyond my power to devote to the work of preparing this paper. I shall therefore confine myself for the most part to a consideration of the poisonous plants of the eastern United States and of Japan, with the flora of both of which I have some degree of familiarity.

Even with this restriction my subject covers a large number of plants of various and often very valuable properties. It will possibly surprise many to learn that there are no less than thirty-nine species of poisonous plants in the United States, either indigenous or naturalized, which are mentioned in a recent work on Medicinal Plants, as either now or formerly considered valuable in the treatment of disease. Yet how common is it to see in descriptions of patent medicines the statement, that the compound "is entirely harmless, as it contains only vegetable substances." The charlatans who make up these "taking" descriptions are either wofully ignorant or count, possibly justly, upon a wonderful degree of ignorance in their—victims; shall I say? It should be more generally known that many of the most virulent of poisons are of vegetable origin. Morphine, strychnine, aconitine, and prussic acid, may be mentioned, as examples of generally known poisons which are of this character. I cannot, however, think of this faith in the beneficent nature of plants, those immediate products of the soil, and the life-giving waters, air, and sunshine, but as infinitely to the credit of human nature. Child-like man—man nearest to God—is ever trustful. It is sad to think of the many rude shocks, the result of primitive faith in the goodness of Nature, which have been necessary to teach man the qualities of the things about him. How many times, when pushed by stern necessity, he must have partaken of vegetable products with noxious qualities, only to repent when too late; perchance escaping himself, to continue a life held worse than death, bereft of those he held dearer than life itself.

In taking up a subject of this character it seems desirable at the outset to form a clear conception of its exact nature and limitations. A poison, in the ordinary understanding of the term, signifies a substance capable of destroying life when taken in small quantities. More generally a poison may be defined to be a substance having an inherent deleterious property, rendering it capable of destroying life by whatever avenue it is taken into the system; or it is a substance which when introduced into the system, or applied externally, injures health or destroys life, irrespective of mechanical means or direct thermal changes. Only when taken in the sense implied in the last of these phrases does the term become comprehensive enough to include all the plants of which I shall speak.

I find, however, the decision of the question, what plants to take up, somewhat difficult, since my subject is poisonous plants and not vegetable poisons. Under the latter caption the limitations of the subject would be perfectly evident; but, while I find no difficulty in defining a poison, and while it is usually possible to ascertain from published works whether any given plant contains a poison, I do in some cases find myself in doubt as to whether a given plant should be regarded as poisonous. Just what should be comprehended under the term poisonous plants, I find it troublesome to decide. Should I, on the one hand, consider all plants poisonous which contain a compound capable of acting as a poison; or, on the other hand, should I include under the term only such plants as are likely to cause disease or death when some natural part or product of the plant is in question. In other words are we to rank as poisonous all plants from any part of which a poisonous principle can be extracted in quantity howsoever small; or should we restrict the term to such as contain the poisonous principles in such quantities as to render the use of some part or parts in natural form dangerous to health or life? Should the subject be considered in the former sense, even with the geographical restrictions which I have assigned myself, it would comprehend such a number of species as to render its appropriate consideration upon this occasion an impossibility. My intention, therefore, is, to include only such species as may be dangerous to either man or beast in such forms as they are likely to be met with or prepared without resort to the refinements of chemical extractive processes.

The poisonous principles found in plants are of several distinct classes. By far the greater number of vegetable poisons, however, are alkaloids; but besides compounds coming under this class, there are a few poisonous acids and glucosides. In a number of instances the poisonous principle resides in an essential oil, while in a rather surprising number it has not yet been determined. The natural alkaloids are complex and quite variable compounds somewhat resembling ammonia. They contain carbon, hydrogen, and nitrogen, and some of them also contain oxygen. If they do not contain oxygen they are usually volatile. One of the best known of the non-volatile alkaloids is morphine, the most active principle in opium, which, as is generally known, is derived from the poppy. Nicotine, the well known poisonous alkaloid of tobacco, is an

example of the volatile class. The vegetable acids are also of very variable composition. They contain carbon, hydrogen, and oxygen. One of the most poisonous is the oxalic acid, found in sórrel and many other plants; fortunately it is usually in proportion so small that the plant is harmless.

The glucosides are compounds, usually containing only carbon, hydrogen, and oxygen, but in a few instances nitrogen also, which, combining with water, have the property of forming that sugar which is known to chemists as glucose (grape sugar), or some other saccharine matter. The poisonous principle in the buttercups and euphorbias appears to be of this class.

The essential oils, all containing carbon and hydrogen, and some in addition nitrogen and oxygen, are yet more variable in their composition. Such oils are in some cases volatile; in others they are non-volatile. Oil of hemlock, oil of tansy, and oil of juniper, are well known examples.

Concerning the general nature of the poisonous principles found in plants, I have only to add that in numerous instances compounds of more than one of these classes co-exist in the same plant. Thus, for example, in the poison hemlock we have an alkaloid, an acid, and an essential oil, while in the buttercups we have a glucoside, an acid, and an essential oil.

Poisons have been included under four classes, known as corrosives, irritants, neurotics, and gaseous. The first three of these classes are abundantly represented among vegetable poisons. The corrosives, among other general effects, eat into the delicate tissues with which they come in contact. Oxalic acid is a good example. The irritants cause violent inflammation of the parts with which they come in contact, and usually prove fatal through their action upon the alimentary canal, causing violent purging, though there are also probably always well marked nervous symptoms. The essential oils and many of the alkaloids act in this manner. The neurotics produce very marked nervous symptoms, which are the indirect cause of death. Prussic acid, morphine, strychnine, and aconitine are among the best known poisons of this class.

We do not find the gaseous poisons largely represented among natural vegetable products. These poisons sometimes act as irritants; in other cases they produce a specific effect, such as entering into combination with the red pigment of the blood,

rendering it incapable of carrying oxygen. The best — and so far as I am aware the only — example of a gaseous poison among natural vegetable products is afforded by several species of the genus Rhus, which undoubtedly sometimes poison without contact, acting as a very powerful irritant.

Concerning the Cryptogamous plants, which properly come within our field, I shall be brief. They are numerous, but in many cases neither the plant itself nor the nature of its poisonous principle is well understood.

In this connection, though possibly not in themselves directly poisonous, I must allude to the various micro-organisms which are often a cause of serious illness and even death. The development of vegetable organisms of a very low order (ferments and bacilli) upon a certain class of nitrogenous foods, such as fish and meat, sometimes results in the production within such foods of a class of compounds known as ptomaines, which are very active and virulent poisons. Here it is probably not the plant itself which is the poison, but substances which are the result of its growth. So far as the effect goes, however, it makes no difference whether it is plant or product which does the mischief, and the two have always been associated in fatal cases so far as I am aware. While I was in Japan a case, for some time very mysterious, of ptomaine poisoning was brought to the attention of the authorities. Professor H. E. Stockbridge — then of Sapporo, now President Stockbridge, of North Dakota — succeeded in tracing the mischief to the use of an article of food known to the Japanese as *sushi*. This is a mixture of rice and fish, to which a little rice wine is added, the whole being allowed to ferment until the wine is converted into vinegar. It is usually allowed to become decidedly strong before eating. The poisonous principle in this case proved to be the alkaloid known as *muscarine*, the identical compound upon the presence of which the poisonous qualities of some species of mushrooms depend. Two other ptomaines were also found in this food.

Since, under certain conditions, poisonous alkaloids may be formed under the influence of bacilli, in highly nitrogenous foods, especially meats and fish, usually perfectly wholesome, which have undergone partial putrefaction, the obvious deduction is that such articles should neither be used as food nor be given to animals.

The mushrooms perhaps more appropriately come under my subject, as many of these contain, in themselves, a virulent poison-

ous principle. This is probably in all cases dependent upon the presence of an alkaloid, of which muscarine, just now alluded to, is the best understood. This alkaloid takes its name from the species *Agaricus muscarius*, the best known and first investigated of the poisonous mushrooms. The numerous instances of serious illness, and even death, resulting from the consumption of mushrooms supposed to be edible and wholesome, should serve as a sufficient warning against experimenting with the plants of this class. No one, not perfectly familiar with all the characteristics of edible species, should venture in this field; and I shall attempt no description of the respective characteristics of the edible and poisonous mushrooms, believing that, unless made far more specific than would be either appropriate or possible on this occasion, such descriptions are more likely to prove mischievous than useful, through tempting persons, qualified neither by natural capacities nor by training to make the nice distinctions essential to safety, to select where danger lurks on every side. The only safe rule is to reject all mushrooms not positively identified by some one perfectly familiar with such matters.

Coming now to Phænogamous plants, I find a large number of species, representing many orders and genera, which are more or less poisonous. I have endeavored to exclude everything, the poisonous character of which is not well vouched for, depending, in the case of United States species, upon Millspaugh, Hooker's translation of Le Maout and Decaisne's General System of Botany, and Gray; and in the case of Japanese species, following Motoyoshi Ono's list. In some instances, the poisonous character of species in Ono's list does not seem to be confirmed by the work of occidental botanists and chemists, and I am aware that the list is incomplete. I follow it, however, in the absence of a later authority, and prefer to state the Japanese notions in regard to those species noticed, just as I find them set down.

Ono's list includes representatives of sixteen orders and twenty-seven genera, and numbers thirty-eight species. Most of the orders in this list are represented by poisonous species in the United States. The only ones not so represented are Fumariaceæ, Coriarieæ, Ilicineæ, Amaryllidaceæ, and Alismaceæ. With the exception of the second and third, these orders are represented in our flora, and possibly by species quite as poisonous as the Japanese. The poisonous nature of our species does not, however,

appear to be established. We find, also, in Japan, species set down as poisonous, belonging to Phytolaccaceæ and Loganiaceæ. These orders are represented in the United States by species which contain a poisonous principle, but which do not appear to come properly under our consideration if we adhere to the rule of selection which I have adopted.

The orders represented by poisonous species in both countries are Ranunculaceæ, Papaveraceæ, Anacardiaceæ, Umbelliferæ, Ericaceæ, Solanaceæ, Thymelæaceæ, Euphorbiaceæ, and Liliaceæ. In the United States we find undoubtedly poisonous species also in Berberidaceæ, Cruciferæ, Droseraceæ, Caryophyllaceæ, Sapindaceæ, Leguminosæ, Lentibularieæ, Primulaceæ, Asclepiadaceæ, Urticaceæ, Coniferæ, Araceæ, and Gramineæ. We find, also, species which contain a poisonous principle which can be extracted by chemical processes belonging to Geraniaceæ, Compositæ, and Lobeliaceæ. This enumeration of the orders containing poisonous species, tedious in itself, has seemed necessary to show the very wide distribution throughout the vegetable kingdom, of plants which it is believed in all cases contain virulent poisons. Naturally, however, there is the widest difference in the characters and degrees of virulence of these poisons. I will now take up each of these orders and point out some of the chief peculiarities, properties, and uses of the poisonous plants in each.

Ranunculaceæ.—In this order all of the Buttercups are more or less poisonous. Perhaps the most active is *Ranunculus sceleratus*. Death has been known to follow from the internal use of the plant, while the yellow oil which can be extracted from all the species is a powerful poison. The active principle appears to be an acrid narcotic; but the Ranunculi contain glucosides, acids, and essential oils. The poisonous principle appears to be volatile and is generally expelled by boiling. Accordingly the buttercups are occasionally used as pot herbs and usually with safety; though illness sometimes follows. In view of the well known poisonous properties of these plants it would seem to be about time that the pleasant picture of the peaceful cow, grazing upon the yellow buttercup and making golden butter, which exists in the minds of non-agricultural writers of rural poetry and prose, were abandoned. Every farmer's boy knows that cows, as a matter of fact, never do feed on these plants.

The allusion to butter brings to mind that I have seen the statement that the juice of certain Ranunculi has been used to coagulate milk in cheese-making, in place of rennet. Such cheeses must be of the hardest white oak character, though made of the best of Jersey milk, because they could never by any possibility cure into anything other than dried curd; as it is the action of rennet during the process of curing which renders the curd in part soluble and digestible.

Besides the buttercups, we have in Ranunculaceæ one yet more powerful poisonous species, *Helleborus viridis*, in the United States. The glucosides Helleborin and Helleborein, found quite abundantly in this species, especially the former, are very powerful poisons. They appear to be most abundant in the root.

One Japanese author credits *Clematis paniculata* with poisonous properties, and says that if flower or leaf be chewed it spoils the teeth, or will cause them to drop out; and in large quantities causes vomiting, dizziness, and death. It is used as a cathartic.

Several species of Aconitum grow in Japan, and their highly poisonous character is well known. The value of aconitine in medicine as a diaphoretic is, also, too well known to need description. The use made of one or more of the Japanese species by the Ainos, the aborigines of Japan, in poisoning their arrow heads, deserves passing notice. Like most savages these people make the process of preparing their poison a secret which is known to but comparatively few even of their own numbers. As nearly as can be learned, they reduce the root to a pulp, mix it with materials of unknown character, but, in the opinion of Dr. Stuart Eldridge, who has investigated this subject,* probably inert, and then bury the mixture in the earth. When exhumed it is found to have become a stiff, dark, reddish brown paste. One side of the arrow head, which is left hollow for the purpose, is smeared with a mixture of this paste and some animal fat. About ten grains of the paste appear to be generally used. The arrow head is rather weakly lashed to the shaft, it being desired that it shall be detached and left in the wound, which, owing to the weakness of the bow used, is generally a slight one. These bows are set in the woods so as to command one of the usual run ways of the animal to be taken, and the animal himself is made to discharge

* Transactions of the Asiatic Society of Japan, Vol. IV, p. 78.

the arrow by means of a stout cord which crosses his path. The chief animals taken in this way are bears, which reach a very large size. One of the first effects of the poison appears to be paralysis; and it is asserted that the animal is almost invariably found dead, within a very short distance of the spot where wounded. The flesh of animals so killed is freely used as food; though the precaution is taken to cut out quite a large piece of flesh about the wound.

The Ainos know no antidote for this poison, saying that the only way to save life, in case of a wound inflicted accidentally or by design, is by the immediate excision of the wounded part.

Berberidaceæ.—This order includes one species which Gray says is poisonous. This is *Podophyllum peltatum*, commonly known as Mandrake, the leaves and roots being drastic and poisonous. The great importance of this plant, as the source from which podophyllin, a widely used cathartic, is derived, is generally known. This plant is common and found in most collections.

Papaveraceæ.—The best known, perhaps, of all the vegetable poisons, opium, which is the inspissated juice of the plant, comes from the poppy, which has escaped from cultivation in some localities, but I will not take up your time in talking of this. Besides the poppies, we have in this order, two generally known species, reputed to contain poisonous principles, viz.: *Chelidonium majus*, and *Sanguinaria Canadensis* or Bloodroot. Of the former Ono says: "It is poisonous, and cannot be eaten either boiled or raw." Millspaugh mentions no instances of poisoning of either man or beast from eating these plants; but speaks of death from overdoses of drugs extracted from them. Ono mentions, also, *Macleaya cordata*, which he says must not be eaten. He adds that if boiled with bamboo this herb has the property of making that cane soft, whence its common Japanese name.

Cruciferæ—*Sinapis alba*, the White Mustard, is set down as poisonous. The essential oil extracted from the seeds is a virulent, irritant poison. Sheep and cattle, however, may be freely pastured upon the green plant with no injurious results, so that the plant, perhaps, should hardly be included in our list.

Droseraceæ.—The Droseras, or Sundews, contain a highly poisonous principle which has been used in medicine, and it has long been considered poisonous to sheep, according to Millspaugh.

I have never known of an instance of poisoning among sheep from eating it, however; probably because they are unlikely to eat it in sufficient quantities.

CARYOPHYLLACEÆ.—In this order we have the Corn Cockle, *Lychnis Githago*. This is a naturalized species, commonly growing in grain fields. The seed is with difficulty separated from the grain and is, consequently, sometimes ground with it; and instances of injurious consequences following the consumption of bread made from such flour have been observed. Poultry of some kinds will eat the seeds, but death follows. Some observers say that chickens will not eat it, though it is often placed before them in wheat screenings.

FUMARIACEÆ.—This order is credited by Ono with one poisonous species, *Corydalis Wilfordi*, the smell of which he says sometimes causes vomiting.

CORIARIEÆ.—This order, not represented in the United States, furnishes in Japan the very poisonous *Coriaria Japonica*. This genus, according to Hooker, contains in its leaves, and especially in its seeds, an acrid and powerful poison, and he adds that the adulteration of senna with the powdered leaves of plants of this genus sometimes makes that a fatal medicine. Ono says children in Japan often die from eating the fruit; and adds that it receives its common name from the fact that it is often used as a rat poison.

GERANIACEÆ.—Several species of oxalis and sorrel contain that very virulent poison, binoxalate of potash, commonly known as oxalic acid; but not in such quantities as to render the eating of the plants in moderation particularly injurious. There can be little doubt, however, that the practice of children's eating these leaves because of their pleasant acid taste should be discouraged. It may be remarked in passing that the tubers of some of the stemless species of oxalis are edible and wholesome.

ANACARDIACEÆ.—The numerous species of Rhus, including the Poison Ivy (*Rhus Toxicodendron*) and Poison Dogwood of this country (*R. venenata*); the Lacquer Tree (*Rhus vernicifera*), and a number of other species; including the *Rhus Toxicodendron*, or Poison Ivy, in Japan, render this an especially important order. It is the one order of poisonous plants which almost every one knows, because there are comparatively few who have not felt its effects or seen those who have experienced them. Though so

widely known and bearing such an unenviable reputation as poisonous plants, the species of this genus do not appear to be dangerous to life. The ordinary, well known effects of ivy poisoning need no description. They are caused by a volatile acid which appears to be thrown off from all parts of the plant. The ordinary symptoms, though not dangerous, should not be neglected, as under neglect permanent marks are sometimes formed. Millspaugh mentions a case where the crust formed remained chronic for thirty years.

The same authority says that a resin extracted from *Rhus venenata* is sometimes a constituent of polishes used in shoe manufacturing, and that he has met cases of poisoning among workmen whose business was the application of such dressings.

The great economic value of the *Rhus vernicifera*, which furnishes the invaluable lacquer of Japan, undoubtedly the finest of all varnishes, is generally known. This species also yields in its seeds a vegetable tallow which is collected in large quantities, extensively used for domestic purposes and largely exported. This Rhus is much cultivated for both purposes and would possibly be hardy here. I have three small trees in Amherst, which have withstood four winters and made a rapid growth.

The workmen in the lacquer industry usually suffer from Rhus poisoning at first, but soon become inured to it in so far as to suffer no active symptoms. I have often been struck with the sallow, unhealthy appearance of such workmen; but so far as I am aware this trade is not supposed to shorten life. Freshly finished lacquer ware may cause all the ordinary symptoms of Rhus poisoning; but when old there is no danger in handling it.

It appears somewhat singular, at first thought, that plants apparently so venomous are not more dangerous if taken internally. I have known a well authenticated instance of the giving by mistake (in place of a tea which, if I remember aright, it was intended should be from the elder) of a strong infusion made by steeping the stems of the poison dogwood, and it was followed by no injurious consequences. I have also seen the larvæ of a species of the gipsy moth feeding voraciously upon the leaves of *Rhus Toxicodendron*. This was in Japan where acres of forest, in which the undergrowth was a dense thicket of low growing poison ivy, were almost entirely defoliated.

The immunity of some individuals from the ordinary effects of contact with ivy and dogwood, and the extreme susceptibility

of others even to their proximity, are anomalies which it is hard to account for. There would seem to be need for furthur study concerning the nature of the poisonous principle in these plants.

SAPINDACEÆ.— This order contains one species, the Ohio Buckeye (*Æsculus glabra*), the fruit and leaves of which, Hooker says, are considered deadly poisons. I do not feel sure that the species deserves such characterization.

LEGUMINOSÆ.— *Gymnocladus Canadensis*, the Coffee Tree, furnishes some principles useful in medicine, and its seeds are said to have been used as a substitute for coffee. Insects have been observed to be attracted to trees of this species in large numbers only to meet with death as a result of feeding upon its leaves; and these leaves, sprinkled with molasses water, have been used as a fly poison with success.

UMBELLIFERÆ.— This order contains a large number of poisonous species, both in the United States and Japan. Death has been known to follow eating the roots of *Pastinaca sativa*, or Wild Parsnip, and such roots seem to be especially dangerous in their second year. The roots ef *Archangelica atropurpureum* when fresh are poisonous and are said to have been used for suicidal purposes by the Canadian Indians. In regard to *Æthusa cynapium*, or Fool's Parsley, there appears to be some difference of opinion, some asserting that it may be freely eaten; others that it is highly poisonous. It is possible that locality sometimes affects its character so far as to make it at times harmless; but it appears impossible to doubt that serious illness and even death sometimes result from eating it. Millspaugh quotes from a German medical journal, an account of the fatal poisoning of two children through partaking of soup in which this plant was boiled. *Thaspium aureum*, or Meadow Parsnip, appears to have a highly poisonous root. The fatally poisonous qualities of *Cicuta maculata* (Water Hemlock) and *Conium maculatum* (Poison Hemlock), are too generally known to need especial mention. I do not remember to have seen any recent mention of injurious consequences to cattle resulting from eating either of these plants; but while in Japan, the Sapporo Agricultural College herd lost one fine Shorthorn cow from eating of the closely allied *Cicuta virosa*. Ono speaks of this as highly poisonous, and cautions his readers against even touching it. I doubt whether he is right here, for I have often handled it with impunity. The Water Parsnips,

belonging to the genus Sium, are poisonous according to Gray. *Conium maculatum* appears to be more poisonous to carnivora than to herbivera. Horses have been made to eat considerable quantities of the dried plant without seriously injurious consequences. Most of these plants are credited by Millspaugh (homeopathist) with yielding medicinal agents of some value. They contain both alkaloids and essential oils.

Ericaceæ.—The laurels, azaleas, rhododendrons, and even the Indian pipe, of this order, are undoubtedly poisonous; and Ono includes Andromeda also. There can of course be little or no danger of any person's eating any part of these plants, and they are not ordinarily poisonous to the touch. There is, however, one recorded instance of such poisoning, which happened to a young lady. While she was handling the plant the stem was accidentally crushed and some of its juice spurted upon her lips. She suffered all the ordinary symptoms of Rhus poisoning. It should be added that her lips were somewhat chapped, so that more of the juice was absorbed than would ordinarily have been the case.

That sheep, especially young animals, and calves are sometimes killed by eating the leaves of both *Kalmia latifolia* and *Kalmia angustifolia* is generally known. This is most likely to occur in winter or at any time when grass is short. That some animals eat these leaves with impunity appears to be certain. Some species of deer are known to feed upon them, yet it is stated by some authorities that the use of the flesh of animals, such as the hare, and of birds, such as the pheasant and partridge, which have fed largely upon laurel or its fruit, is poisonous to man. It is asserted that the use of the milk of goats which have browsed upon poisonous herbs is sometimes attended with fatal consequences. There appears to be some doubt of the accuracy of the observations upon which these statements depend, or at least others report opposite results.

The nature of the poisonous principle in the laurels is not understood; but it is generally held that the *Kalmia angustifolia* is the most poisonous of our species. Though we cannot understand, we can the more readily believe the apparent anomalies just alluded to, in view of the undoubted fact that some of the caterpillars of the gipsy moth can freely eat leaves sprayed with Paris green and thrive thereon, while others quickly succumb to its poisonous effects.

The honey extracted from the flowers of azaleas and rhododendrons, according to Hooker, is extremely poisonous. Such honey is credited with having maddened the soldiers of Xenophon, and is supposed to have been gathered from the flowers of *Azalea Pontica*. To what extent our honey bees garner from our native and cultivated species, I am unable to state; but it would seem certain that they must do so to some extent. The uniformly wholesome character of our honey indicates that this poisonous character cannot be very pronounced.

Ono says that if cattle eat the leaves of *Andromeda Japonica* they act as if intoxicated, whence its common name, which means "to intoxicate the horse." These leaves are said to be used as an insecticide.

Our Kalmias are included among medicinal plants by Millspaugh, but they are probably of little value as such.

LENTIBULARIEÆ contains one species, *Pinguicula vulgaris*, reputed poisonous to sheep, according to Hooker.

SOLANACEÆ.—A considerable number of species in this order are undoubtedly poisonous. In the United States we have the nightshades, *Solanum Dulcamara* and *S. nigrum*, the berries of both of which appear to have been the cause of death in some instances. The fruit of the first has often been eaten without injurious consequences, but should be avoided, as there is certainly one well authenticated instance of death following its use. Numerous deaths have occurred among children as a result of eating the berries of the *Solanum nigrum* (Black Nightshade), against which they should be particularly warned. This species is found in Japan, and its fruit has the same reputation there as here, as has also that of *Solanum lyratum*. Both are reputed medicines, as are also the two United States species of which I have spoken.

Hyoscyamus niger, or Henbane, contains a highly poisonous alkaloid, Hyoscyamine; and both roots and young shoots have caused death. The seeds are more poisonous yet. The species furnishes a drug useful in some cases of delirium.

Datura Stramonium contains a highly narcotic, irritant poison. The use of its shoots as a pot herb has sometimes produced serious results. Beverly, in his history of Virginia, has the following concerning some soldiers sent to Jamestown to quell the rebellion of Bacon, who partook of these shoots: "the effect

of which was a very pleasant comedy, for they turned natural fools from it for several days. One would blow up a feather in the air; another would dart straws at it with fury; another, stark naked, was sitting up in a corner like a monkey, grinning and making maws at them; a fourth would fondly kiss and paw his companions, and smile in their faces with a countenance more antic than any in a Dutch droll. A thousand simple tricks they played, and after eleven days returned to themselves again, not remembering anything that had passed." The seeds appear, also, to be highly poisonous. The highly poisonous character of tobacco, which belongs here, is well known and will not be dwelt upon.

Our Japanese author speaks of two other Solanums, *Scupula Japonica* and *Datura alba*, as poisonous. The roots of the first, in times of famine, are gathered, he says, under the impression that they will serve as a substitute for potatoes; but they cause death. All parts of the second, he says, are poisonous. The seeds cause insanity, and its common name signifies "mad egg plant."

PHYTOLACCACEÆ.— Ono says the root of *Phytolacca Kœmpferi* produces craziness and even death; but that it will cure chronic rheumatism.

ASCLEPIADACEÆ.— *Gonobolus macrophyllus*, according to Hooker, furnishes an acrid, milky juice which has been used to poison arrows; and *Periploca Græca*, according to the same authority, has been successfully used to poison wolves.

LOGANIACEÆ.— This gives us, in the United States, the so-called Pink Root (*Spigelia Marilandica*), which contains a poisonous principle but furnishes a valuable medicine; and in Japan, *Buddleia curviflora*, concerning which we find the statement that "if mixed with coal and thrown into water it causes the fish to float upon the surface as though intoxicated." It is further added that such fish are poisonous to man.

THYMELÆACEÆ. — Three Daphnes, *D. Pseudo-Mezereum*, *D. Kiusiana*, and *D. Genkwa*, are said by Ono to be poisonous, causing numbness and sometimes death. The bark of the first is sometimes used for making paper. The third, if thrown into the water, causes the fish to float upon the surface and sometimes to die. It appears doubtful whether these species deserve their reputation as poisonous, although they undoubtedly contain a

poisonous principle. *Dirca palustris*, or Leatherwood, appears to be moderately poisonous, serious results from eating its berries being recorded.

EUPHORBIACEÆ.— The Euphorbias all contain a poisonous principle. Our Japanese author includes five species in his list as poisonous, and among American species *E. hypericifolia* and *E. corollata* are alluded to by Millspaugh, as producing poisonous effects. Momentary blindness, he says, is sometimes experienced while gathering the plant. "Slabbers" in horses is supposed to be caused by these species. They are all reputed to have useful medicinal qualities. The castor bean, *Ricinus communis*, and *Elœococca cordata*, according to Ono, also contain poisonous principles. He states that death has resulted from the consumption of food fried in the oil extracted from the seeds of the latter.

URTICACEÆ.— An infusion made from *Urtica urens*, a stinging nettle, has caused intense suffering, producing frightful swellings of a most hideous appearance upon various parts of the body, but the patient ultimately recovered. The ordinary stinging sensations produced by contact with this species is too well known to need description.

CONIFERÆ.— The seeds and leaves of *Taxus baccata*, or Yew, are said to be very poisonous, but the fleshy part of its fruit is edible.

LILIACEÆ.— The False Hellebores (*Veratrum*), of which we have three species in the United States (*V. viride*, *V. Woodii*, and *V. parviflorum*), and the same number in Japan, have highly poisonous roots, useful as insecticides; the white hellebore, so useful in destroying the currant worm, coming from the root of *V. album*, which is one of the Japanese species.

GRAMINEÆ.— *Lolium temulentum*, Bearded Darnel, according to Gray, is almost the only instance of a grass with noxious qualities. Hooker says the seed is poisonous and if mixed with cereals causes "vomiting, giddiness, and intoxication."

With this hurried and imperfect sketch, I must leave this part of my subject. The limits of time which I mentally assigned myself when beginning to write have already been exceeded; but one important—and to me very interesting—side of the subject has not been touched. I allude to the reasons for the formation in plants of these poisonous principles. This subject does not appear to have been adequately studied. A somewhat careful

examination of the works on physiological botany by Sachs and Vines, and of Darwin's writings on the origin of species and cognate subjects, has disclosed little on this point. I will call attention to a few points only.

Vegetable physiologists appear generally to look upon the alkaloids as waste products, produced as a result of changes within the plant, necessary to the formation of indispensable constituents, but themselves of no further use. Organic acids and glucosides they regard as intermediate products, incidentally formed during the synthetic processes which go on in the plant. They are stepping stones, so to speak, on the road to something directly useful or essential to the plant,—the dough which later becomes the finished bread.

The acids may, in some cases, act as digestive agents, just as certain acids play an important part in the work of digestion in the animal economy.

Naturally, since there is such a wide variety among poisonous substances, the reasons for their formation must be various. My instinct is always to look for the explanation of all observed peculiarities in plants in the relations of such peculiarities to the plants themselves. Nature appears to hate useless parts or qualities in her children.

The fact that the poisonous principles in plants are often stored in parts of the plant, such as bark, leaves, or seed envelopes, which are later cast off, is regarded by Vines as evidence that they are to be looked upon as waste materials. It at once occurs to my mind, however, that it is precisely in such portions that the poison would prove useful in the particular direction in which it appears to me it must most frequently serve the species, viz.: for protection. The frequency with which we find the poison most abundant in seed and fruit suggests this purpose, for these aré the parts, for the production, protection, and dissemination of which, the plant labors, so to speak, from the start. In bark and leaf, also, the poison must most efficiently serve to repel insects and animals which would consume.

In conclusion, then, I desire to express my conviction that we owe the existence of this great class of substances—for the most part so useful as medicines, though poisonous if taken in excess —to the action of that universal tendency, in obedience to which every species becomes gradually better and better fitted to survive in the unending struggle for existence.

Discussion.

Rev. Calvin Terry inquired what antidotes or remedies were recommended in cases of poisoning by the plants which had been mentioned in the lecture.

Professor Brooks replied that if the poison had been taken into the stomach, a physician should be called, but that an emetic might be given at once, and when that had taken effect, a strong cup of tea would probably prove useful, as the tannin it contained would cause the poison then remaining, if an alkaloid, to assume an insoluble form, and thus render it for the time being, harmless. Persons who enter and remain long in a poorly ventilated room, freshly varnished with lacquer, are sometimes poisoned by the gases arising from the varnish in drying. It is like Rhus poisoning, causing a distressing inflammation of the skin. A thorough bath in an alkaline water is an excellent remedy. Common bi-carbonate of soda is a good alkali for this purpose. This treatment is more efficacious if taken as a preventive. Another way to apply it is by a bandage, which should be kept constantly wet with the alkaline water.

Mrs. P. D. Richards had found a strong solution of salt and water beneficial in external poisoning, especially for botanizing students; but perhaps a wiser plan would be to wear a good pair of gloves while botanizing.

Professor Brooks remarked that most poisons from plants are acids; therefore alkaline applications, such as solutions of bi-carbonate of soda or of common salt, used either as a bath or by bandages kept saturated, are generally useful.

President Kidder said that a gentleman friend who was quite easily poisoned found that an application of soap in the form of a strong lather was a remedy. Mr. Kidder stated that he was himself very susceptible to plant poisons, and had tried the lather-bath with success, as the irruption never came out after a thorough washing of this kind.

Professor Brooks said his experience had been the same as President Kidder's, but that this treatment should be used as a preventive measure, at once upon reaching home after a ramble during which one had been exposed to such poisoning influence; otherwise it will fail.

Mr. Terry said he could hardly go within a rod of poison ivy, or other similar plants, without being poisoned. But he knew

others who were not so affected; they could even handle such plants with apparent impunity. He had been told of various remedies; one says, use peat or mud applications; another, plantain leaves; and still others recommend soap, as sure to mitigate the suffering from poisoning.

Professor Brooks referred to the Japanese as recognizing a great number of poisonous plants. They are made particularly familiar with this class of plants from their search for material for "greens;" for which purpose they make use of a great variety of wild as well as cultivated plants. He said they probably use this kind of food to a much greater extent than do any other people. Everybody rambles over fields as well as public grounds, gathering plants and young shoots for greens. In a lecture before a body of market gardeners, sometime since, a list was given of eighty-four or eighty-five species of plants collected for this purpose. Some that are poisonous when gathered are rendered harmless by cooking.

Thomas Harrison asked for a remedy for the poison of the stinging nettle.

Professor Brooks expressed doubt whether the sting of the nettle is poisonous. He spoke of a person he knew, who fed the green plant to her young turkeys regularly, and he never heard of any harm coming from such practice.

Mr. Harrison inquired whether White Sumach is poisonous. A friend of his declared it to be so.

Professor Brooks did not know that white sumach was poisonous. It appears remarkable that some persons are so highly sensitive to the poisonous effect of plants, while so many others are not at all affected by them. But while we cannot understand why it is so, we can more readily believe these apparent anomalies, in view of the fact that some caterpillars of the gipsy moth can and do eat with avidity the leaves of plants that have been carefully and thoroughly sprayed with Paris green, and apparently they thrive upon it, although most of the species die quickly after eating but little of it.

A lady knew of seven cases of poisoning; one of which was that of a little girl who simply inhaled, or tried to inhale the odor of the flowers of the Mountain Laurel—*Kalmia latifolia.*

Mr. Harrison said that if Paris green fails, as a remedy for the gipsy moth, we must find another. Stavesacre—*Delphinium staphisagria*—holds a high place among insect poisons.

Professor Brooks said that there is no doubt of the exemption of some individuals of the gipsy moth caterpillars, from the poisonous effect of Paris green. The fact has been fully established by the careful experiments instituted by Professor Fernald for the purpose of testing this question.

Mr. Terry asked why is the world filled with such dangerous productions? Why were they created? It must be another method for teaching us to discriminate between good and evil, both material and moral.

Professor Brooks believed this provision to be of practical use to the plants. It is of great advantage to them in the struggle for existence. It teaches both animals and insects to avoid them. The fact that the poison is more frequently in larger amount in the seed — the most precious product of the plant — appears to corroborate this view. This class of plants is extremely useful to us; many medicinal remedies are prepared from them, in accordance with the rules of the pharmacopœias, which are esteemed valuable. Then again, by practical experiment it is found that if some poisonous plants are cultivated, they not only lose their poisonous character, but become exceedingly valuable as food for our race; the potato is one example and celery is another. Is not the poison eliminated under culture because it is no longer necessary to preserve the species? We find that wild animals, when domesticated, lose some features or characteristics which were prominent in their primeval condition. The horns of cattle, which are very long and large in the wild state, become reduced to a small fraction thereof, after many generations of domesticated life. This rule holds good in other orders of animals.

Mrs. H. L. T. Wolcott took a practical view of the subject. She had learned that in West Roxbury the city of Boston has cut out many rods of roadside bushes, including considerable quantities of poisonous plants; and she suggested that this Society should take steps to secure the removal of such growths from roadsides in other districts, and exert its influence to have woodland freed from these dangerous plants. In this respect we have a duty to children, who should be protected from harm; especially should an effort be made to eradicate those noxious species of Rhus. She felt a deep interest in this subject as she was quite susceptible to the poison of plants, and had suffered a great deal in consequence, although she had tried every remedy suggested

by the specialists. She had also been inconvenienced by having workmen on her farm laid by several days at a time in consequence of poisoning while cutting ditches where such plants were found growing. It is better to prevent suffering, which even soap, recommended by the President, would not always relieve.

Mr. Harrison had been exempt from injury by poisonous plants nearly all his life, and thought himself poison-proof. He could formerly handle such plants freely; he would haul them up into heaps and suffer no way in consequence. But a while ago he was digging in a part of Cambridge which had been filled several feet over the marsh, and while digging at the point where marsh and filling met, he became severely poisoned. He ascribed it to the decaying vegetation, but never learned what plants ever grew there. His son had always been very susceptible to the poison of plants. Mr. Harrison believed many persons were poisoned by the poison ivy in the autumn, by gathering its brilliant colored leaves with those of other plants, they being ignorant of the character of the plants from which the leaves were taken.

Professor Brooks said that from the statements made here today showing the varying degrees of susceptibility to plant poisoning, and also the difficulty of finding men to cut down or dig up, poison ivy, it is evident that there is room for a new profession, viz.: that of "Poison Ivy Exterminators." We live in an age of specialties, and this new profession would seem to be especially suited for those fortunate individuals who are exempt from the effects of this poison. But even those not naturally exempt need not despair of entering it, for in Japan many persons who, on beginning to work in the lacquer industry, suffer more or less from Rhus poisoning, gradually acquire immunity from its effects, or at least become so far hardened that they suffer from none of the active symptoms.

Mr. Terry called attention to the fact that the leaflets of the *Ampelopsis quinquefolia* (Virginia Creeper) are in fives, while those of the *Rhus Toxicodendron* (Poison Ivy), sometimes mistaken for the former, are in threes.

John C. Hovey stated that he had never been poisoned by Rhus of any kind, but he had been poisoned by the stinging nettle,—*Urtica dioica*.

Professor Brooks, in reply to a question, said he supposed that, in cases of Rhus poisoning, the varying degrees of susceptibility

were due to the difference in the texture of the skin of the several patients; but that matter could be determined only by examination.

President Kidder spoke of a case where the plant, *Ampelopsis Veitchii*, climbing upon a stable, pushed a branch in at a window, and a horse was poisoned by eating the growing plant.

Professor Brooks stated that any green food, to which a horse is unaccustomed, may cause its death by fermenting in its stomach. Ono makes no mention of the Japanese Ampelopsis as a poisonous plant.

On motion of O. B. Hadwen, a vote of thanks to Professor Brooks for his able and instructive lecture was unanimously passed.

Mr. Hadwen, as Chairman of the Committee on Discussion, also announced that on the next Saturday, a paper upon "Aquatic Plants," by L. W. Goodell, of Dwight, would be given.

BUSINESS MEETING.

SATURDAY, March 11, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

No business being brought before the meeting it

Adjourned to Saturday, March 18.

MEETING FOR DISCUSSION.

AQUATIC PLANTS AND THEIR CULTURE.

BY L. W. GOODELL, Pansy Park, Dwight.

No class of plants is attracting more attention at the present time than the aquatics. The great interest that has been awakened in them is chiefly due to the fine displays that have been made in the public parks and at the shows of our own and other Horticultural Societies, during the past few years. They are now grown in the parks of nearly all the large and many of the smaller cities of the country, and always attract the attention

of crowds of people. Boston seems to be the only large city without aquatic plants in its parks. I am informed by Superintendent Doogue, that the conditions here are unfavorable for their culture. It would be interesting to know what there is in the water or soil of Boston injurious to them.

No more attractive feature can be added to any public park, or private place, than a water garden. There are thousands of natural ponds scattered all over the country, in which the many beautiful hardy water lilies would grow to perfection, and take care of themselves if once introduced.

Nearly all kinds can be grown with success in large tubs, or cemented tanks of any size desired; and that large class of flower lovers who cannot afford a large and expensive water garden, can cultivate and enjoy them in this way with little expense. On many places there are small streams of water running through rich meadows, where an artificial pond can easily be made. The earth for the bottom of such a pond, if not already rich, must be made so, by the addition of thoroughly decayed manure. One of the most important points in the cultivation of aquatic plants, especially the tender varieties, is warm water, and in selecting a site for an artificial pond, whether it is to be large or small, it should be where it will get as much sun as possible, at least for six or eight hours during the day; and, if possible, where it will be sheltered from the cold north winds, by trees or buildings. If the water garden is to be of small size, it is best to make it in some regular form, like a circle, oval, or parallelogram; but if large, an irregular outline, like a natural pond, is more pleasing. If the water supply comes through pipes and is limited, it is necessary to cover the bottom and sides with a coating of cement. The soil should be excavated to a depth of two and one-half feet, and the bottom, after being shaped, should be pounded down as hard as possible. It should be gradually sloped to the top, from a line within four or five feet of the edge; or, it can be made of the full depth to the edge, and an eight-inch brick wall laid for the sides. This is the most common way, but it adds considerably to the expense and is not necessary, except in soils that heave badly with frost in winter. But if the edge is well protected with leaves or straw and boards — as the edge of all cemented ponds ought to be — there is not much danger of injury in any soil. A small pipe should be laid upon the bottom to some lower

part of the grounds for the purpose of drawing off the water when necessary for planting or cleaning the pond. A fountain can be added if desired, but if the tender aquatics are cultivated it should not be allowed to play except on special occasions, or when necessary to keep the pond full; otherwise the cool water would lower the temperature too much.

Aquatic plants are hearty feeders and the soil for them should be of the richest possible nature. Good turfy loam and at least one-third part of thoroughly decayed stable manure should be used, and the addition of some good, high-grade, commercial manure, at the rate of three or four pounds to each cubic yard of soil will cause a more rapid growth. The soil should be spread to the depth of a foot over the bottom and pounded down as hard as possible; then spread on two inches of sand or fine gravel to hold the soil down and prevent it from mixing with the water.

To insure success in growing the tender Nymphæas without artificial heat, shallow water is one of the most important points, as the sun heats it up much better than deep water. During the early part of the season four or five inches is enough, which may be increased to a foot as the season advances. The best season for planting all kinds of aquatics is the spring, and the first of June is early enough, in this latitude, for the tender varieties. When ready to plant, draw off nearly all the water, set stakes where the plants are to grow, and set them out just as you would set plants on dry land. The large, tender Nymphæas should be set from eight to fifteen feet apart; and the hardy varieties from four to eight feet.

In planting large artificial or natural ponds, do not, above all things, set the Nymphæas in regular rows at equal distances apart, as though it was an agricultural crop needing cultivation with a horse hoe. This I once saw done in a pretentious public park. Conceal the artificial, and imitate Nature as closely as possible. Let the planting be done in irregular groups around the margin. Give some of the plants plenty of room for full development, with here and there a scattering plant to partially connect some of the groups, but leave plenty of open water between, and in the middle of the pond.

The attractiveness of a water garden is greatly increased by harmonious surroundings, and there is no more appropriate place for the cultivation of subtropical plants, such as Cannas, Musas,

Caladiums, Castor Beans, and the like, than in a border on the north or back side.

To grow the large, tender water lilies to full size and perfection, artificial heating of the water is necessary. This is usually done by running over the bottom of the pond coils of pipes from a conveniently located greenhouse boiler. Instead of covering the entire bottom of the pond or tank with soil, it is better to put it in boxes a foot deep and three or four feet square, and a depth of at least two feet of water over the crowns of the plants is best.

In beginning a list of aquatics, the grandest of all, that truly royal plant, *Victoria regia*, should stand at the head. To grow this magnificent plant in the open air to full size, with flowers from twelve to fifteen inches across and leaves from six to eight feet, requires a tank thirty feet or more across and artificial heat, all of which involves considerable expense. But it can be grown and flowered without artificial heat with good success even in cold New England, with little expense. I have flowered it in this way for three years. The most important point to ensure success is, to get a strong growth early in the season. To accomplish this, I set out a good plant about the first of June, and then made a frame around it of planks ten or twelve feet square and wide enough to come five or six inches above the surface of the water and covered it with hot-bed sash; this gave nearly all the advantages of artificial heat; the temperature of the water and soil often rose to one hundred degrees, which caused very rapid growth, soon filling the frame with leaves. Both sash and frame were then removed to give the plant more room. My plants made leaves five feet across and were in flower for a month. The variety experimented with was the crimsoned-flowered *Victoria Randi*. This differs from the typical Victoria, in having the vertical rims of the leaves much higher, and the flowers turn to a deeper red when they fade. It also flowers earlier, and the plants do not grow so large.

Euryale ferox is an East Indian water lily resembling the *Victoria regia* in its general appearance, but its leaves are only two feet across, and they do not turn up at the edge; its flowers are small and of a deep violet color. It is much hardier and more easily grown.

The most attractive and popular of all aquatic plants are the Nymphæas, and there is nothing in the floral world more gorgeous

than some of the tropical varieties. These are divided for the sake of convenience into day-blooming and night-blooming species. The day-bloomers open their flowers early in the morning and close about the middle of the afternoon. The night-blooming varieties open after sunset and do not close until nearly noon of the next day, if the weather is cool or cloudy. Each flower opens four times. The following are day-blooming varieties:

Nymphœa Zanzibarensis is one of the most beautiful and the most easily grown of the tropical water lilies. Its flowers are of a rich, deep blue, and when well grown will measure fully ten inches in diameter.

N. Zanzibarensis azurea is like the preceding in everything except color, which is of a lighter shade.

N. Zanzibarensis rosea varies in color from a pale rose to deep rose, almost crimson in some specimens. All of the above varieties are very free blooming, beginning when the plants are quite small and continuing until frozen up in the fall. They are so hardy that they will stand a good deal of cold weather without material injury.

N. scutifolia is, also, very easily grown, and bears an abundance of flowers all summer. These are from four to six inches across and of a light blue, shading to white in the centre. It is a native of the Cape of Good Hope, and is hardy south of Washington, D. C.

N. stellata, from tropical Africa, is a free blooming and desirable species, with large, bright blue flowers.

N. gigantea is a native of Australia, and is considered by many to be the finest of all. Its flowers are of the largest size, with numerous petals of a beautiful purplish blue, shading to white at the base, and it has a mass of golden stamens. This species when well started grows freely and produces flowers in abundance, but is one of the most difficult of all to manage in the younger stages of its growth. The young plants have a disagreeable habit of losing their foliage, and the tubers then go to rest for an indefinite length of time. I have had tubers remain dormant two years, in spite of all efforts to start them into growth.

N. elegans is a pretty species from New Mexico and Texas, with small white flowers tinted with pale blue.

N. gracilis, from Mexico, has large white flowers resembling those of *N. dentata*, but the plant is of smaller growth.

N. flava, from Florida, has small, golden yellow flowers, but is of little value for northern culture in the open air, as it seldom blooms here.

N. Mexicana is a new species from Mexico, which was thought at first to be identical with *N. flava*, but it is quite distinct. The plant is of stronger growth, the foliage larger, and it also flowers quite freely in the open air here. Both of these species must be kept over winter in a greenhouse in growing condition.

The following are night-blooming varieties.

N. Devoniensis, a hybrid between *N. Lotus* and *N. rubra*, raised many years ago by the Duke of Devonshire, is one of the most gorgeous varieties in cultivation. The flowers are of a brilliant, rosy red; from ten to twelve inches across, and borne in abundance, a dozen or more often being open on a plant at one time.

N. rubra is a native of the East Indies; it resembles *N. Devoniensis*, but the flowers are more cup-shaped and of a lighter color.

N. Sturtevanti is a hybrid of American origin and a magnificent variety but a poor bloomer. It resembles *N. rubra* in color but the petals are broader and the foliage is quite distinct.

N. Lotus is a native of the tropics of the Old World. It grows in abundance in lower Egypt, and is the true Sacred Lotus of the ancient Egyptians and was sometimes engraved on their coins. The seeds and roots when dried and ground were made into bread by them. The flowers are six to eight inches across with broad, white petals.

N. dentata is the largest of all white water lilies, the flowers being from ten to fourteen inches across and of a pure, paper white. It blooms very freely through the season and is one of the easiest of the tropical Nymphæas to grow.

Hardy Nymphæas.— Water lilies that will endure the winter in the Northern States are called hardy. The books tell us, and it is generally believed, that no water lily will bear actual freezing of the roots, and that they must be planted in water deep enough to be below the reach of frost. But my experience during the past winter has convinced me that this is an error, which, while easily disproved, nobody seems to have hitherto detected. One of my artificial ponds is supplied with water by a small stream which was frozen up during the severe weather of January, and the pond dried up, freezing to the bottom. This pond contained my stock of *Nymphœa odorata rosea*, *N. alba candidissima*, and

N. Marliacea chromatella. Being very anxious as to their condition I had large blocks of ice cut out. The roots were frozen solid in the soil to a depth of six inches and had to be cut out with an axe. Several of each variety were thrown under a greenhouse bench to thaw out, when it was found that not a single bud on them was injured in the least, and they are now making good growth in a tank of water. It is very likely that other varieties will also stand freezing of the roots, but this can only be determined by actual tests, as some varieties may be more susceptible than others.

Nymphœa odorata is our own well known, fragrant water lily, and is considered by many the most beautiful of hardy varieties.

N. odorata rosea has beautiful rose-colored flowers, and is known as the Cape Cod Pink Water Lily, because it was first discovered there many years ago. It is now extensively cultivated and is generally considered the most lovely of hardy varieties.

N. odorata superba is a fine variety with larger flowers than the type.

N. odorata minor is a variety having flowers only about one-half the size of the common, and is very pretty. It grows in abundance in the ponds of New Jersey.

N. odorata sulphurea is a new variety with yellow flowers and will no doubt become a great favorite. Its foliage is mottled with reddish purple and brown spots.

N. odorata exquisita is a new variety with rosy carmine flowers, of a deeper shade than those of *N. odorata rosea.*

N. odorata gigantea is a native of Florida, where it was discovered two or three years ago. Both flowers and foliage are larger than the type. The flowers are more cup-shaped and are produced later in the season and it is a freer bloomer. The leaves are very large and thick, often measuring over a foot in diameter, and sometimes nearly two feet; their edges are ruffled and sometimes turned up, forming a slight rim after the manner of the *Victoria regia.*

N. odorata Caroliniana is the largest and finest of all the *odorata* varieties. It is supposed to be a cross between *N. odorata rosea* and *N. alba candidissima*, and was raised by Dr. H. T. Bahnson of North Carolina. It has the vigorous habit and free-flowering qualities of the latter variety. The flowers are quite fragrant, from four to six inches across, and of a delicate salmon-rose color, deeper in some specimens than in others.

N. alba is the common White Water Lily of Europe, with flowers larger and more freely produced than those of our common variety, but without fragrance.

N. alba rosea is a pretty, pink variety of the preceding, but not so deep in color as our Cape Cod pink variety nor as desirable, as it is a poor bloomer.

N. alba candidissima is the largest and best of all hardy, white water lilies. The flowers are pure white, the petals very broad, and much more waxy than those of *N. odorata*. It begins to bloom in May, and continues to bear its superb flowers in abundance until frozen up in the fall. With good treatment the flowers measure from five to seven inches across, and I have counted as many as twenty-two open at one time on a strong plant.

N. tuberosa is the common, native species of the Western States. It has large white flowers, but does not bloom well in cultivation.

N. pygmœa is the smallest water lily known and is a little gem. It is a native of China and Siberia. Its flowers are white and about the size of a silver half-dollar, opening at noon and closing at night. It is a free bloomer, being the first to flower in the spring and the last in fall.

N. pygmœa helveola is a good variety with light yellow flowers about two inches in diameter.

N. Marliacea chromatella is one of the very choicest and best of the hardy varieties. The plant has the vigorous habit of *N. alba candidissima* and it flowers freely from May to October. The flowers are from four to six inches across, with broad petals of a beautiful light yellow, and bright orange stamens. This variety should be grown in water two feet or more deep. If grown in shallow water its abundant foliage grows in a bunch so thickly as to hide the flowers, while in deep water its leaves spread out and float on the surface.

N. Marliacea albida has medium sized flowers of a pure paper white, resembling those of *N. alba*.

N. Marliacea carnea is of a delicate blush or flesh color, and a charming variety that will become popular.

N. Marliacea rosea is of a delicate rose color, deeper than the preceding, and a great acquisition.

N. Laydekeri rosea is the newest and one of the finest of the small varieties. Its flowers, which are freely produced and are

about two inches across, are of a peculiar rosy-purple color in the centre, shading to white at the tips of the petals.

Nymphæas cross with each other very readily, but the raising of new varieties in this way is yet in its infancy, and the possibilities in this direction have only just begun to be realized. The time is not far distant when varieties will be much more numerous than now. M. Marliac, the French grower to whom we are already indebted for some of the choicest varieties, has two superb novelties which will be flowered for the first time in this country at the Chicago Columbian Exposition. One of these has been named *N. Laydekeri rubra punctata*, and has large flowers variegated with brilliant red. The other, named *N. Marliacea flammea*, has flowers of an amaranth red with orange red stamens. Several American growers are also doing good work in this line. Benjamin Grey has a beautiful new variety which has been named *N. Greyœ*; it is a cross between *N. gracilis* and *N. scutifolia*. In habit it resembles the latter, but the flowers are of a bright rose pink, are larger than those of *N. Zanzibarensis*, and borne on stout stems from fifteen to eighteen inches above the water. It is a great acquisition.

William Tricker, of Staten Island, has a new variety, not yet named. It is a seedling of *N. dentata*, supposed to be crossed with *N. Zanzibarensis rosea*. The petals are wider than those of *N. rubra*, and more like those of *N. Sturtevanti*. They are white at the base, shaded to rosy carmine at the tips.

Some varieties of water lilies are easily grown from seeds, and it is exceedingly interesting to watch their development from the seeds to flowering plants. The easiest to raise from seeds are the *Nymphœa Zanzibarensis* varieties, *N. scutifolia*, *N. cœrulea*, and *N. dentata*. The seeds should be sown in February or March, in small pots of good soil well firmed down. Scatter the seeds on the surface and cover with an eighth of an inch of fine sand. Then they should be immersed in a pan of water deep enough to cover the tops an inch or two. The water should be kept at a temperature of from 75° to 80° until they germinate, which will be in from six to ten days. If the temperature is much less than that named they will not germinate at all, or only after a long time. The seeds of *N. dentata* require about three weeks. Before the plants get crowded they should be transplanted to three-inch pots, and be shifted to four inch, if necessary, before the time to plant them out

in June. Those who have no greenhouse can start the seeds near a stove in the dwelling-house where the water will keep at the right temperature, moving them to a hot-bed, cold-frame, or a warm, sunny window, when up. The little plants grow with astonishing rapidity under proper conditions, and begin to bloom in about one hundred days. I have had the Zanzibar varieties begin to flower in sixty-five days, from seeds started in June. These varieties are particularly well adapted to tub culture.

The *Victoria regia* is always propagated from seeds, which should have the little caps or shells that cover the germs, carefully removed before sowing. Plant in five inch pots in February, covering them with an inch of soil. The water should be kept at a temperature of about ninety degrees. They germinate in from fifteen to twenty days, but are always more or less uncertain about coming up, even with the best of care.

The Nuphars are interesting plants, resembling the Nymphæas. They have yellow flowers borne on stems above the surface of the water. *N. advena* is our common native species. *N. pumilum* is a pretty species of smaller growth. *N. Japonicum* is a new species from Japan. *N. luteum* is a European species.

The Lotus, or Nelumbium, is one of the most magnificent of aquatic plants. Its grand circular foliage (sometimes two feet or more in diameter) and gorgeous flowers rise four or five feet above the surface of the water. Its flowers are produced freely from June to September, each flower opening four times. At first they are cup-shaped, but on the last day they expand to a diameter of from six to twelve inches. There are two species and several varieties, all of which are hardy here, having endured four or five winters where ice formed a foot or more thick over the roots. They can be grown in any warm pond with a rich, muddy bottom, in water not more than two or three feet deep. There is no reason why Lotus ponds should not become as common in this country as they are in Japan. The plants spread rapidly by means of runners beneath the surface of the mud, these runners often travelling several rods in a season. Thick tubers are formed deep in the pond, during the latter part of summer, which live over winter. The best time to move and plant them is in the spring, when they are just starting into growth, which is the latter part of May in this latitude. The tubers should be covered six inches or more with soil. The Lotus can be easily grown in large

tubs, which should be moved to a cellar in winter, or cemented basins can be made in the lawn, where it would do still better. If grown in a water garden with other aquatics the roots must be confined in compartments to prevent them from injuring other things. Make partitions of bricks, set on edge in cement, and high enough to come a little above the surface of the soil. The soil should be very rich and not less than a foot deep.

Nelumbium luteum is the American Lotus, a native of the Southern and some of the Western States. Its flowers are of a sulphur-yellow color.

N. speciosum is commonly called the Egyptian Lotus and is the "Sacred Lotus" of the Hindoos. Its flowers are creamy white shading to pink at the tips of the petals. This does best in a rich clay soil.

N. speciosum roseum has flowers of a bright pink, shading to bright rose at the tips of the petals. This variety makes a stronger growth with me than *N. speciosum*, and is in every way superior to it.

N. speciosum album grandiflorum has large, pure white flowers.

N. speciosum album striatum is white, splashed and marked with crimson on the edges of the petals, and is a superb variety.

Limnocharis Humboldti is a showy plant bearing an abundance of lemon-yellow flowers all summer. It is commonly called the Water Poppy, from the resemblance of the flowers to those of the California Poppy. It has oval, floating leaves, and multiplies by means of runners which creep about in shallow water. It succeeds best in water not more than six or eight inches deep. It is half-hardy but must be wintered in a house.

L. Plumieri is a fine, tender species, a foot or more tall, with rich, velvety, green leaves and spikes of small, lemon-yellow flowers.

Eichhornia crassipes major, which has been given the appropriate common name of Water Hyacinth, is of very easy culture and great beauty. Its glossy, dark green leaves have thick, bulb-like leaf-stalks filled with air, causing the plants to float on the water. It bears large spikes of delicately colored flowers resembling in form a spike of hyacinth blooms. Each flower is two inches in diameter and of a soft, lilac rose color with a blue blotch near the centre, enclosing a golden-yellow spot. It will grow and flower if left floating on the surface of the water, but

grows and flowers much better if set on the edge of a pond, where it can grow in the soil. Here it will soon spread and form a large mass of plants, and bloom freely for several months. It can be grown in the house in winter, in a tub, pan, or anything that will hold a little rich soil and water. It makes a very interesting window plant, and would be well worth growing even if it had no flowers.

E. azurea is a very choice and beautiful species from Brazil. Its flowers resemble those of *E. crassipes major*, but they are light blue with a deep indigo-blue centre. Its manner of growth is entirely different; it branches freely and creeps about on the surface of the water, very much like a verbena on dry land, each plant covering a space from three to five feet in diameter, and it keeps in bloom all summer.

Pontederia cordata, our native Pickerel Weed, has spikes of blue flowers and is well worth growing on the margin of an aquatic garden. There is a fine, white variety of this species which was sent me from New Hampshire last year.

Limnanthemum Indicum — the East Indian Water Snowflake — is an exceedingly pretty and interesting aquatic recently introduced. The plant throws up leaves to the surface like a Water Lily, and the flowers are borne in clusters on the petioles near the blade; roots are also emitted at the same place, forming a new plant. The flowers are pure white, an inch or more across, and thickly covered with a growth of hairs, like the Mrs. Alpheus Hardy chrysanthemum, but much more numerous. In a tub or shallow pond it will flower all summer, and all winter in a warm room or greenhouse. It will stand considerable freezing without injury, but must be wintered in a house.

L. nymphœoides is the European Floating Heart, with pretty, golden-yellow flowers. It is perfectly hardy and should be introduced with caution in an aquatic garden, as it spreads very rapidly and is liable to become a nuisance unless care is taken to keep it in check.

L. lacunosum, the native species, is pretty and interesting with its clusters of white flowers.

L. trachyspermum is a native of the Southern States, and resembles *L. Indicum*, but does not have the hairy growth.

Myriophyllum proserpinacoides is a native of Brazil, and has been given the common name of Parrot's Feather, on account of

its beautiful pinnate leaves. It grows in shallow water and is one of the prettiest plants that can be imagined for a water-tight hanging basket, vase, or tub, containing some rich soil, and kept filled with water. Several plants should be set around the edge and they will soon trail over the edge several feet in the most graceful manner, completely covering the vase or basket with the most beautiful foliage. It is not quite hardy.

Sagittaria Japonica flore pleno is a very choice, double-flowered Arrowhead, from Japan, and is perfectly hardy. The flowers are white, nearly as large and double as a balsam. It grows best in water not more than six inches deep.

S. Montevidiensis is a very large, tender species growing three or four feet high, bearing spikes of large, white flowers with a crimson spot at the base of each petal. It is easily grown from seeds and should be treated as an annual.

Ouvirandra fenestralis, the Lace-leaf Plant, is one of the curiosities of the vegetable kingdom. It is a native of Madagascar, and has long, narrow leaves which spread out horizontally beneath the surface of the water. They are of a dark green color, and are merely a network resembling a skeletonized leaf or a piece of lace. It can be grown in a warm house in pots of rich soil, immersed in a pan or tub of water kept at a temperature of about 70°.

Cyperus Papyrus is the Egyptian Paper Plant, and should be in all collections of aquatics. It has triangular stalks from five to eight feet tall, supporting at the top an umbel of long, narrow leaves. It grows best in rich soil and shallow water, and is tender.

C. alternifolius resembles the preceding, but is of smaller growth with wider leaves.

C. strictus is also a desirable species. It grows six or seven feet tall.

Zizania aquatica is a highly ornamental annual grass from six to ten feet tall, which grows in abundance in the lakes and rivers of the Western States, where it is known as Indian Rice. It has been introduced, and is now naturalized in some places in the Eastern States, growing in shallow water. Care should be taken not to allow the seeds to scatter about, or it may become a nuisance in a water garden.

Azolla Caroliniana is a pretty, moss-like plant which floats on the surface of water, covering it like a carpet. When grown in

the shade it is of a beautiful green, but is tinged with red in the sun. Patches of it here and there have a very pretty effect, but it multiplies very rapidly, and soon becomes so abundant as to be unsightly, if too freely introduced.

Pistia stratiotes, or Water Lettuce, is a native of Florida. It forms a rosette of beautiful velvety, yellowish green leaves, and floats on the surface of the water, or takes root in the mud in shallow places. It needs a warm, shady place in the house.

Salvinia natans is a little floating plant with soft, green, hairy leaves.

Aponogeton distachyon from South Africa — sometimes called Cape Pond Weed — is a very fine, tuberous rooted plant, with oval, floating leaves, and forked spikes of very fragrant, white flowers. It is hardy if planted below the reach of frost, or it may be grown in a tub in a greenhouse in good, rich soil.

There are many other species and varieties of aquatics, some of them natives of this country, which are interesting and could be easily introduced in a water garden, but the above list contains the most valuable of those in cultivation at the present time.

The announcement for the next Saturday was a paper on Tuberous Rooted Begonias, by John G. Barker.

BUSINESS MEETING.

SATURDAY, March 18, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

No business being brought before the meeting it

Adjourned to Saturday, March 25.

MEETING FOR DISCUSSION.

TUBEROUS ROOTED BEGONIAS.

BY JOHN G. BARKER, Superintendent of Forest Hills Cemetery, Boston.

It may be interesting to you to know who was the introducer of these deservedly popular plants; and to inform you we make an extract from the "Gardening World": "The honour belongs

to the late Richard Pearce, a native of Plymouth, England, to whose energy and daring as a traveller we are indebted for the earliest species, introduced from Bolivia and Peru. He also sent home from La Paz, *Begonia Pearcei* and *B. Veitchii*. He travelled largely and collected many good things, which were introduced by James Veitch & Sons and Benjamin S. Williams. In 1867 he went to Panama for William Bull, where, unfortunately, he contracted a fever and died a fortnight after his arrival, which added another name to the long roll of intrepid men who have lost their lives while endeavoring to enrich our gardens with the beautiful plants of foreign lands." It was said of him that "though a man of small stature he had a lion's heart, and his early death was a great loss to British horticulture."

In the "Tuberous Begonia, its History and Cultivation," by contributors to the "Gardening World," we are informed that all the varieties of the Tuberous Begonia then in existence (1888), both single and double, were derived from six species, viz.: *B. Boliviensis*, *B. Pearcei*, *B. Veitchii*, *B. rosæflora*, *B. Davisii*, and *B. Clarkei*, and of these the first named five were introduced into England by James Veitch & Sons, of Chelsea, and by them put into commerce.

We find that *B. Boliviensis* was the first of the series introduced by the Messrs. Veitch, and in 1867 it was figured and described in the Botanical Magazine, t. 5657, as "a tuberous-rooted, deciduous kind." *B. Pearcei*, the next to arrive, in 1865, also came from Bolivia. This is also figured in the Botanical Magazine, t. 5545, with description.

B. Veitchii was the next addition, made in 1867, and put into commerce in 1869. It proved quite valuable, for practically it is the progenitor of the varieties which give the round flowers so much admired. It is figured and described in the Botanical Magazine, t. 5663.

B. rosæflora was imported by the Messrs. Veitch from the Andes of Peru, and flowered first in the Chelsea Nursery in 1867. It is also figured in the Botanical Magazine, t. 5680.

B. Davisii was discovered by Veitch's collector, near Chupe, in Peru, and flowered for the first time with them in 1876, and was placed in commerce three years later. It is figured in the Botanical Magazine, t. 6252.

B. Clarkei was first flowered in 1867, and is figured in the Botanical Magazine, t. 5675.

Garden Hybrids.—The first hybrid raised in Europe, and without doubt the first one put into commerce of which any record can be obtained, was *B. Sedeni*, which was sent out by the Messrs. Veitch in 1870, having been raised by their foreman, John Seden. It was introduced to public notice in June, 1869, when it was awarded the Silver Floral Medal of the Royal Horticultural Society, as "the best new plant shown for the first time in bloom." After this introduction we find a selected list of eighteen varieties raised by James Veitch & Sons, which were sent out between the years 1870 and 1882; these were undoubtedly selected from many thousands of seedlings, which shows how very careful this firm must have been in selecting that number only in twelve years.

In our search we find that the same firm introduced a valuable white variety, which was named Queen of Whites, and was sent out in 1878, at half a guinea each. About 1871, the interest in the tuberous begonia was developing very rapidly, and we find that James O'Brien (then with Messrs. E. G. Henderson & Son), Mr. Bull, Mr. Sutton, and others, recognizing their usefulness, went to work with much ambition to improve them, and introduce them to the public. Mr. O'Brien has the credit of raising the first two doubles in England; they were Princess of Wales and Princess of Teck, and when exhibited at South Kensington were greatly admired. Other firms were early in the field, among them being Messrs. Sutton & Sons and James Carter & Co. Messrs. Sutton were apparently very successful in introducing new shades of color.

In 1875 John Laing gave his earnest attention to them, believing there was a grand future before them as greenhouse decorative plants. The excellence to which Mr. Laing has brought them is wonderful; we are indebted to him for what is known as the Forest Hill strain. In 1878 Mr. Laing startled the floral world by a magnificent group of seedlings at South Kensington, for which the Royal Horticultural Society awarded its Gold Medal.

Then we hear of the Swanley collection, raised by Henry Cannell, who in 1881 built a house one hundred and fifty feet long, especially for their cultivation. Mr. Cannell has been remarkably successful in raising double varieties, and has a collection of marked excellence.

We have before us a catalogue for 1893, just received from Thomas S. Ware, of Tottenham, London, and we find that in the

great begonia contest, at the International Horticultural Exhibition, in July, 1892, he was awarded the first prize, for a group occupying a space of one hundred and fifty square feet, arranged for effect. If we can judge anything from the illustration, this exhibition was truly grand. In further perusal we find that Mr. Ware has divided them into sections, as follows: 1, Mixed Single Begonias for Bedding; 2, Cheap Single Bedding varieties to Color; 3, Singles for Pot Culture; 4, Singles to Color for Conservatory Decoration; 5, Singles to Color for Exhibition; 6, Singles to Color for Hanging Baskets.

Having made you acquainted with the introducers, and the progress made by our English cousins in the introduction and improvement of a plant which has more than realized all our most sanguine expectations, I now call your attention to the progress made in our own country as far as I have been able to obtain reliable information.

My attention was first directed to the Tuberous Begonia about the year 1878, when a small packet of seed was sent to me by my father, who was then carrying on a floral business in Norfolk, Va. After very careful instructions as to how I should sow the seed, treat the young plants, etc., he remarked that he knew I should watch them with care and be pleased with the result. Being anxious to improve all I could in the style of bedding plants, a carefully selected spot was chosen for the bed of what I anticipated would be my choicest gems. Its location was near the entrance to Pine Grove Cemetery, Lynn; it was protected from the hot sun, about four hours in the middle of the day. The bed was thoroughly prepared, with about one-third each of well decomposed barn-yard manure, leaf mould, and good loam, well mixed. The plants were set out from three inch pots about June 10; they commenced to flower about July 10, and were constantly in bloom from that time until the end of the season, rivalling any bed of flowering plants in the grounds.

In the "American Florist," of March 1, 1886, Vol. I, p. 237, under the signature of "C. C.," we read that "great improvements have been made in this flower within the past few years. At all the large exhibitions in Berlin, Paris, London, etc., these begonias have been well represented, and have attracted much attention." It further says "There are many points in their favor. A compact habit, dark glossy foliage, handsome flowers in

shape as well as richness and variety of color, make them very desirable both for pot plants and bedding. Some of the single ones are of very large size, often measuring from five to six inches across; and the double ones fairly resemble well formed roses and camellias." From this time on we have seen many articles favoring their more extensive cultivation; and while we knew of their being cultivated by numerous growers in perhaps a moderate way, and more largely in the greenhouses, we have not heard of their extensive use as bedding plants until quite recently —say within six or eight years. In the "American Florist" for February 26, 1891, Vol. VI, p. 483, appears a good article with an illustration showing a house of tuberous begonias of J. F. Meech at Charlevoix, Michigan, who writes enthusiastically of the future possibilities of this charming plant.

In the number for October, 1891, Vol. VII, p. 165, a bed is shown around the house of Mrs. Robert Pitcairn, Pittsburg, Pa., which, it is said, was planted June 1, and from the 20th of that month it was a mass of flowers and foliage; it further says, all who have seen this bed admit that these begonias make the handsomest bed of flowers ever seen in this city. This bed was eighty feet long, and eight feet wide at the broadest portion. The greater part of it had full exposure to the sun, but one end was quite shaded, and this end was the poorest part of the bed.

William Falconer, (now the editor of our new semi-monthly visitor, "Gardening,") in the same issue, writes an able article upon tuberous begonias, as he saw them at Thomas Griffin's nursery, Westbury Station, Long Island, N. Y. We all bow to such authority, therefore I ask you again to listen to a very brief extract from this article: "The behaviour of these plants, as we saw them in the open air beds, was very encouraging. The main block of beds was right in the open field and unshaded by anything. The beds showed no gaps and the plants were from ten to twenty inches high and very luxuriant, with fine, bold foliage and a mass throughout of brilliant blossoms. A large mass of these begonias planted in beds slightly shaded by trees showed all the luxuriance and floriferousness of those grown in the open block and undoubtedly are far superior for such a position to geraniums of any sort."

John Thorpe, one of the best known horticulturists in this country, and Chief of the Bureau of Floriculture at the World's

Fair, is equally enthusiastic in his commendation of the tuberous begonia. He says: "I have always considered the tuberous begonia among the most beautiful of flowers; but now that a strain is produced that can be grown out of doors in full exposure to the sun, their value is incalculable. I predict for them a popularity beyond that of any flower ever used for bedding purposes."

William Saunders, Superintendent of the garden and grounds of the Agricultural Department, Washington, D. C., and Professor William R. Smith, Curator of the Botanic Garden, Washington, D. C., speak of their usefulness as bedding plants being very great. William Doogue, of our own city, says that he is convinced that they can be used as bedding plants under ordinary circumstances.

The reason that I have taken so much pains to bring to your attention the opinions of others as to the value of the tuberous begonia is, that I believe there is the greatest future before it of any plant of recent introduction, whether it is used for the conservatory, the window, or the open garden. I think one of the reasons why it is not better known is this: we have been too apt to think that it would not flourish except under glass, and have not had confidence enough to give it a fair trial as a bedder. We have grown it moderately at Forest Hills until last year; but then quite extensively, having planted out several thousands in different locations all through the grounds, in large and small beds, and on graves. In all cases they were the best beds of flowering plants in the cemetery, affording a remarkable variety of color in their flowers,—white, rose, orange, yellow, scarlet, and crimson, in numerous shades. Then a comparison between them and other flowers is a great feature in their favor. The geranium has thus far had the lead as the best bedder, but I am strongly inclined to think that hereafter the leading plant will be the tuberous begonia. I need not remind you how a rain storm destroys the flowers of the geraniums, especially the single varieties, but with the begonia it is not so; they are bright again in twenty-four hours, flower and foliage standing up in bright array, showing no injury received during the storm.

At Forest Hills we are obliged to have large quantities of bedding plants, and we wish to have the best there are going. I think a great advance has been made in the introduction of the Crozy Cannas and the Tuberous Begonias, and I hope they will

speedily take the place of the faded Coleus beds, which are not creditable to any well managed place. Perhaps other old varieties of plants will suggest themselves to you that may be dispensed with hereafter. I think there is but little character to what is usually called a foliage bed; you can go to a dry goods store and buy colored cloth that will produce as good an effect. Of course I do not include the sub-tropical beds, but only those beds which are filled with what are known as foliage plants. Flowering plants are decidedly better; what combination of colored foliage can compare with a solid mass of the tuberous begonias, or a large bed with Crozy Cannas in the centre, surrounded by a broad band of Heliotrope, with a border of tuberous begonias? A bed arranged in this way is not only an object of beauty and a delight to every one who sees it, but if you wish for flowers in the house, you have them there. The begonias are charming for this purpose; if you desire a good bed of flowers, a bright vase, a cheerful window, or some choice cut flowers for decorative purposes, you will not be disappointed in them.

Having had no experience with the double varieties, I have only made the slightest reference to them. I have used all single varieties for our purposes. We depend altogether on seedlings for bedding.

Our mode of cultivation is as follows: the seed was sown January 4, in shallow boxes, in light soil sifted fine, and covered very slightly, after which it was pressed firm with a smooth board, and carefully but thoroughly watered with Scollay's rubber sprinkler; they were then kept shaded from the sun in a temperature of 60°.

The seed germinated January 24, and many of them were large enough to transplant by February 24, shallow boxes and light soil being again used, and the plants set out about one inch apart. It is necessary that they be kept shaded for a few days, or until they are somewhat established; then they are grown in full sunlight, until the sun gets warmer later on in the season, at which time a little shade in the middle of the day will be very beneficial. From these boxes they are again shifted into other boxes which are a little deeper — perhaps three inches — and planted four inches apart. After they are established in these boxes, it is necessary that they should have all the light and air possible, so as to harden them for the transfer to the open ground, which may be made from

the first to the fifteenth of June. They like a deep, rich soil and plenty of water, as they are gross feeders. After the frost has destroyed the foliage the tubers can be taken up and gradually dried off in boxes on the greenhouse benches, where there is plenty of air and light. When dried they should be packed away in shallow boxes and placed in a dry, cool place. As soon as they show signs of growth in the spring, they should be potted in small pots and gradually changed from the small ones to those of a larger size until planting out time comes again. I believe these simple directions will serve for cultivation in the window garden equally as well as in the greenhouse.

As I wish to enforce what I have said by the experience of others, I take pleasure in calling your attention to the experience of two well known cultivators, Frederick L. Harris, gardener to H. H. Hunnewell, Wellesley, Mass., and Thomas Griffin, the large and successful cultivator at Westbury Station, Long Island, N. Y.

Letter from Frederick L. Harris.

For some years past Tuberous Begonias, both single and double, have been grown extensively as decorative plants, and also for bedding. Very few plants of recent introduction have afforded so much satisfaction, and when it becomes more generally known how easy is their culture they will be as common as geraniums. They can never become obsolete, for we have nothing equal to them for general cultivation and gorgeousness. Bedding begonias have become quite a feature at Wellesley, and the method adopted here may be of service to those desirous of engaging in their culture. In March the tubers are potted in small pots and kept in a temperature of 50°, and very little water given until they start into growth. This will be in the course of three or four weeks, when more water may be added, but with caution; otherwise decay will be the result.

About May 25, have your border prepared by being well enriched to the depth of not less than eighteen inches. Then select the strongest, and plant them about one foot from plant to plant, after which water thoroughly. They may not require any more attention, unless a very dry season intervenes, until they begin to bloom, and then a good soaking is necessary, but without wetting the foliage more than is unavoidable. Their after culture

is quite simple; stir the surface of the border frequently and top dress with well rotted manure.

The above remarks are for single begonias only. Doubles do not flower so profusely, but the weight of the flower is such that, the flower stem being weak, rain and heavy dews tend to premature decay, When growing them in pots for conservatory decoration, they certainly deserve a place equal if not superior to the single varieties. To grow these successfully, guard against over watering, although they require a generous supply, provided the pots are well drained, and filled with roots; then you may give water *ad libitum.* Do not syringe, but keep a moist atmosphere. The prettiest and most effective way to grow the doubles to advantage is in wire baskets, and when in bloom remove them to the piazza where they can enjoy a little shade. When needing water — which will probably be twice a day, in a dry time — the most simple and effective way to give it is to take a pail of water and sink the basket in it to soak well; the moss and soil then become saturated, and will not need another plunge so soon as when water is given by pouring it upon the basket.

Letter from Thomas Griffin.

As a plant for the decoration of conservatories or for bedding out, the Tuberous Begonia has few equals. The ease with which they can be grown, and the brilliant effect they produce, will always entitle them to a foremost position with lovers of plants. That their cultivation is not thoroughly understood by the majority of growers cannot be denied; but it is only a matter of time, before they will be quite as popular as the chrysanthemum, carnation, or rose. Then the price of them is within the reach of all, and the small amount of room required to keep them in winter recommends them to cultivators, even if they do not possess a greenhouse. To obtain the best results, you should lay the foundation by starting with a good strain, for a poor one will never give satisfaction. The varieties that have well formed and round flowers, thrown up well above the foliage, are much to be preferred, especially for bedding purposes. There are a few sorts which have immense drooping spikes, that present a very graceful appearance when elevated on a pedestal, where their great beauty can best be appreciated, for that is the only position where

they can be seen to advantage. A house devoted entirely to them, with a few nice palms and ferns to relieve their glowing colors, can be better imagined than described, and is well worth a long journey to see. There are now varieties with such delightful fragrance as still adds to their attraction and gives them the final charm.

Having grown them in England, and for five successive seasons in this country, enables me to speak practically on the subject. We grow them here by the acre, which gives us a good opportunity for testing their adaptability both for out-door and conservatory decoration.

They are easily raised from seed, sown not sooner than the middle of January nor later than the end of February. They have then plenty of time to make strong plants, fit for planting out by the first week in June. They should be sown in leaf mould sifted very fine, and grown on in a temperature of about 70°, gradually hardening them off previous to planting them outside.

The soil should be made very rich, for they should grow without any check from first to last. Choose an open position where roots of trees or shrubs will not rob them of food or moisture, for they cannot survive such deprivation. If they can be shaded for two or three hours during the hottest part of the day so much the better. The east or north side of a house or other building I consider the ideal place for them, though I have grown them by thousands in the open field without any shade from trees or buildings. I consider a little shade beneficial, especially in such a summer as the last. They delight in plenty of moisture, and, therefore, should be mulched with short manure or cocoanut fibre refuse, which helps to retain it, and prevents the ground from getting hard, which frequently occurs from watering them, and also by heavy thunder storms.

Plants from tubers are much preferable to seedlings, especially where immediate effect is required; they also make much larger plants. They should be started into growth by placing them close together in shallow boxes or under the benches, in a temperature of about 60°, and slightly syringed once or twice a day. It does not matter whether or not they have any soil at this stage, but as soon as growth commences they must be brought to the light, and every encouragement given them to grow sturdy and strong.

They must not be coddled with too much heat or moisture, especially if required for out-door planting later on; for the leaves will be too thin to stand the weather, and consequently, will burn easily, thus giving the plants a check and spoiling their beauty. About the first week in March is a good time to start them for bedding purposes, giving them plenty of time to make plants by June, and is much perferable to starting them later and hurrying them on in heat.

If required for the conservatory they should be started in the same manner as advised above, and be potted on as they fill their pots with roots. Ten or twelve inch pots are large enough for the final shift, and by feeding them with liquid manure when the roots are running thickly round the pots they will continue to grow and flower for a great length of time. It is very essential at all times that they have good drainage, for though they like plenty of water while growing it must never become stagnant about their roots.

Good, turfy loam, with one-fourth short manure well mixed with it, will grow them to perfection. A little bone-dust may be added, but all patent fertilizers must be avoided; the chemicals contained therein are apt to have a decaying influence on the tubers. Liquid manure from either cow or horse dung, well diluted and used clear, is both safe and beneficial.

If grown under glass they must be shaded to prevent the temperature running up too high, and ventilation, both top and bottom, with the floors damped once a day, will suit them admirably.

Discussion.

Henry Ross said that Mr. Barker's paper had interested him very much, because it was so practical and straightforward in stating the views of the writer. But he could not agree with all that had been said. He thought Mr. Barker's remarks too condemnatory of the use of foliage plants and foliage beds. If anything is beautiful and gives pleasure and satisfaction, it is a bed of foliage plants. The difference in opinions leads to discussion, and that is one object of these meetings. He did not care to see too much foliage bedding, but if such planting were done away with, he would consider it a great loss. Mr. Barker gave

him some tuberous begonias, which he planted out, and he was much disappointed in the result, but he found that he did not cultivate them rightly; he did not make the ground rich enough. He went to Forest Hills to see how the plants succeeded there, and was delighted with what he saw. But he would not have geraniums discarded; they grow quite evenly, and if any inequality appears, the plants can be trimmed into shape readily. The begonia is apt to send out strong, one-sided shoots, which give the bed an irregular appearance. Mr. Barker had given to him a large number of plants of tuberous begonias, which he proposes to plant out in the coming season, and hopes to grow them successfully this time.

E. W. Wood referred to the quotation from John Thorpe, of Pearl River, New York, as given by Mr. Barker, and then asked if the difference in tuberous begonias, as to ability to bear full sunshine was peculiar to certain varieties. He then remarked that the tuberous begonia was a recent child with Mr. Barker, which accounts for his enthusiasm in its favor. He further stated that as a testimony in support of the continued use of foliage plants for bedding, he would say, that the handsomest ornamental bed he ever saw, was one filled with foliage plants, at Pine Grove Cemetery, of which Mr. Barker then had charge; and Mr. Wood believed that Mr. Barker designed and directed the planting of that bed.

William Stone, Superintendent of Pine Grove Cemetery, Lynn, spoke of some beds of tuberous begonias which he planted; one was where the shade of an elm tree fell upon it during two or three hours in the middle of the day; another bed was in the full sunlight except at the latter part of the day; both were beautiful, and gave entire satisfaction. He agreed entirely with Mr. Barker as to the brilliant future in store for the tuberous begonia. He also endorsed the praise given to the Crozy Cannas, of which he has one seedling which he considers superior to the parent. He said geraniums had been the most popular bedding plants during so long a period that a change was very desirable, and the present excellence of the begonia is such as to give it great popularity. But it is possible that we shall some day wish to go back to geraniums; in fact, while we enjoy the new we also wish to retain the old for variety of material. In reply to a question, Mr. Stone said he used mostly the single-flowered tuberous begonias.

Edward L. Beard said the tuberous begonias had been known a long time. His interest in them dated back sixteen years, and he had spent considerable money in importing and experimenting with them. But the interest of amateurs is more important than that of professionals. He was convinced that amateurs would find them more or less disappointing, for these reasons: first, that it is difficult to keep the tubers over winter under ordinary conditions, and, second, if planted in the open ground dry, as early as possible they will not come into bloom until the middle of August, and possibly as late as the first of September, giving a very short season of perfection of bloom, if indeed the flowers come to make a satisfactory showing. Therefore, if one has no greenhouse or other effective means of starting them early in the spring, which is necessary to bring them into flower soon after being planted out, there will be a great opportunity for disappointment. He did not wish to throw discredit upon them, for he esteemed them, in perfection, just as highly now as he did sixteen years ago. He would not deny their effectiveness when started early in a greenhouse; but who can start them thus early without a greenhouse or some other suitable means, which the average amateur does not possess? Without a suitable place to dry them off, and to keep them afterwards until the time to start them in the spring, they are very apt to suffer from either wet rot or dry rot, if not injury from a chill.

Mrs. P. D. Richards inquired if the tuberous rooted begonia could be successfully grown as a window plant.

Mr. Barker believed this class of plants to be excellent for the window garden; but after their summer growth in the garden they must be dried off and have a period of rest. However, if they are started late and have been in flower but a short time before being lifted for window culture, they might prove of use at that time. But even the commercial grower has not yet awakened to all the possibilities of the tuberous begonia, although they can grow them freely for summer use. He would be suspicious as to any success in flowering with tubers planted dry in the open ground. They can be started in a window successfully. Mr. Barker called upon Mr. Westwood, his assistant, to state how many geraniums and how many tuberous begonias they had on hand. The reply was, "Fifteen thousand Tuberous Begonias and forty thousand Geraniums." Mr. Barker then said there

would be some foliage beds, as well as geranium beds, besides tuberous begonia beds in the grounds; that his remarks upon these three indicated their present comparative importance in his estimation, but that the first two, especially the first, would have their places in less conspicuous parts of the grounds than they have held in the past, while the begonias would be the leading bedding plants. He added as another recommendation of the last, that at any time it is easy to lift plants and set in new ones, or transplant them in order to make the beds more even.

Mr. Stone said he wintered his tuberous begonia roots on shelves in his potting house, over the boilers, where they get very dry. Many of them are now reminding him that it is time they were potted, as they have begun to grow. These plants are more satisfactory than some others, as they can be easily lifted and reset without suffering a check upon their growth.

A lady stated that she planted dry bulbs or tubers in the ground in the spring; that they grew well, and produced flowers in August and to the end of the season. When early frosts came she covered them with papers. Some of the flowers on her plants were five inches across.

Mr. Beard could not believe that any considerable show of flowers could be had before the first of September,—or at best the end of August—from tubers that were planted dry in the ground in the spring. If possible, it must be in a spot highly favored in location. He believed they could not be planted dry like dahlias, and produce a satisfactory show of flowers through the season.

Mr. Barker said the people must be educated before they can be successful in the treatment of plants of any kind. Tubers can be bought and planted in shallow boxes, and started in a sunny window. In reply to a lady who asked about starting the tubers in the pots and soil in which they grew the previous season, Mr. Barker said the tubers could possibly be kept over in the pots in which they grew, but on starting them again the old soil should be all taken off, and fresh soil used, else the tubers would be liable to decay. The tubers should also be planted first, in small pots. He then called upon Thomas H. Westwood, gardener at Forest Hills Cemetery, to state how to treat the tubers in winter.

Mr. Westwood said that anyone who could keep a dahlia during the winter, could keep a begonia tuber. In lifting them

from the bed a good ball of earth is taken with each one, and carried into a dry, cool place, where no frost can get at them, and they can be thoroughly dried. During January and February this earth is all shaken off, the tubers are cleaned, then put in sand, in shallow boxes, and placed under the benches of the greenhouse. They are thus kept dormant until March, when a little more heat and judicious watering are given, which starts them growing. When a little growth is made they are transferred into boxes at least three inches deep, with nice, light soil. From these boxes they are transplanted into the open ground. Seedlings can seldom be successfully raised by amateurs, as the appliances as well as the skill of professionals are required to secure success.

Jackson Dawson was called upon, and said he had no experience in growing begonias, but had noticed that Mr. Sargent was very successful in their production and treatment. He understood that they were started in March and April; that they were put into cold frames as soon as it was safe to do so, and from those were planted out in the open ground. When bedded they make a perfect mass of bloom, which is kept up until frost comes, and he regarded them as the finest and best bedders we have, especially in a shady position.

President Kidder spoke of the inexcusable practice of some persons, who, after the frost has cut down their tuberous begonias, merely take out the roots and rake over the beds, leaving them in such a desolate and unsightly condition not only through the winter, but also until the time to plant begonias again. He suggested that with our great variety of evergreens a fine winter effect might be secured, or at least the beds might be filled with hardy bulbs for a bright display in the spring.

The President announced that on the next Saturday, James Comley would give an account of his observations in Japan, during his recent visit to that far-off and interesting country.

BUSINESS MEETING.

Saturday, March 25, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

The Secretary being absent by reason of illness, Miss Charlotte M. Endicott was appointed Secretary *pro tem.*

No business being brought before the meeting it was dissolved.

MEETING FOR DISCUSSION.

A Visit to Japan.

By James Comley, Lexington.

Some thirty-five years ago, in 1858, I unpacked the first two cases of plants ever imported into the United States from Japan. These comprised the *Lilium auratum*, and six varieties of Retinospora grafted on one stem, which had been cut from the main trunk and placed in damp soil to preserve the grafts. I thought this so singular that it aroused my curiosity, and since that time I have always had a desire to visit the Country of the Rising Sun. Therefore, when in the fall of 1892, Francis Brown Hayes, Esq., proposed a trip to that interesting country and invited me to accompany him, you may be assured that I was very much pleased to have the opportunity. Now, after my visit, I feel that I must go there again before I shall be satisfied, yet I shall never forget the pleasure afforded me through the kindness of Mr. Hayes on this occasion.

We left Boston October 5th, and proceeded to New York, where we arrived on the 6th. When we reached the metropolis, great preparation was in progress for the celebration of the Columbian anniversary. I took a flying trip through Central Park and the place was beautiful, causing me to feel that the people who could not admire the scenes around them there must be indeed dead to all sense of the grandeur of Nature, but everyone seemed gay and to appreciate that which had been prepared for their enjoyment.

We left New York for Chicago the same day, arrived in the Windy City at 9.30 p. m. on the 7th, and reached Council Bluffs on the 8th. Between Chicago and the latter city we passed through vast tracts of cultivated land. There were fields of corn reaching out as far as the eye could carry, with farm-houses half a mile to a mile apart, and these were surrounded by Eucalyptus trees, planted there for shelter. Occasionally we passed through large cattle ranches containing from five hundred to a thousand head of cattle in a herd. But beside these there were great horse ranches with hundreds of animals of all ages running about.

We reached Humboldt Wells on October 9th, and after passing that place came in near view of some of the many wonderful natural phenomena with which our country abounds. Among the most striking of these were huge stones cropping out of the sides of the great mountains and standing clearly and heroically by themselves, fifty to one hundred feet in height. Probably these are the results of volcanic action, but certainly I had never before seen anything so strangely peculiar, towering heavenward as they did.

After leaving Humboldt, we came to a tract of land hundreds of miles in length, in going through which we passed what seemed to be an endless line of vineyards, where the fruit was being prepared for raisins. But in addition to these there was an abundance of apricots, almonds, plums, pears, and all kinds of small fruits. These great fruit orchards were to be seen all the way to San Francisco.

We arrived at the latter city October 10th, after a very pleasant journey. The weather being good all the way afforded us an excellent opportunity to view the beauties of the country through which we passed. So vast did this seem that one could not help thinking you could put the whole European continent down here and yet have plenty of room to grow food and fruit sufficient to supply the world. One ranch which we passed through was at least twenty-five miles in width, with intervals where men were engaged in baling hay for Chicago, and the crop was at least a ton and a half to the acre.

At San Francisco we stopped at the mammoth Palace Hotel, one of the largest and most superbly fitted up establishments of its kind in the world. When walking along the street I noticed a cable car marked "Golden Gate Park" and I at once determined to visit that place, which was reached after a ride of some two miles. I enquired for the superintendent, but that gentleman was not found at this time. However, I met Mr. J. H. Gordon, the second superintendent, who was formerly gardener for Mr. Sturtevant of Roxbury, and who showed me much consideration. We visited the palm house, where there are some magnificent specimens of almost every kind of palm in cultivation. Hanging from the roof was a grand old *Bignonia venusta* in full flower. In the stove house was a marvellous collection of orchids in bloom. From this house I was escorted to the tropical fernery, where there

was a large number of huge baskets hanging, many of which contained scarce and valuable specimens. In a tank in the centre was the *Victoria regia*, the queen of water lilies, in full bloom and bud,— a very fine plant. We passed through other houses containing large and miscellaneous collections of plants, all well worthy of inspection, and I could only regret that my time was too limited to make a more extended examination. Truly these houses reflect credit on the gentlemen in whose charge they are. The site of the park is an undulating tract of ground, just such as an ornamental gardener would desire, and certainly it has been well arranged. Through the centre there runs an avenue some four miles long and from forty to fifty and one hundred feet in width. In this park, the gentry of San Francisco, as a part of fashion's programme, disport themselves every Thursday in elegant equipages drawn by handsome horses, and there I saw some of the handsomest turnouts ever shown. This park is probably the finest in the world, the climate being greatly in its favor for growing tropical and sub-tropical plants. The main avenue leads to the Cliff House, from which there is a grand and expansive view of the noble Pacific Ocean. It is here, too, that we find the renowned Seal Rock, so often alluded to by travellers, where the seals go daily by hundreds to bask in the sun, and a very pretty sight it is to see these harmless creatures as they lie there sunning themselves. As one goes through the park he cannot but admire the acacias, veronicas, and the tacsonia as it hangs from tree to tree, with ferns and palms at intervals. Indeed there is almost every variety of fern known to the connoisseur and they seem to thrive wonderfully. Tea roses, such as Safrano, Maréchal Niel, and Souvenir, and Himalayan Rhododendrons are abundant and in fine cultivation. Shrubs of all kinds are in profusion. One very attractive piece of work was a sun-dial formed of growing plants, which, by an ingenious arrangement of the gardener is made to show the time of day. In the rear of this was a bank of flowering plants and the general effect was as pleasing as it was unique. No less than one hundred and fifty men are employed all the year round in attending to this immense park.

My first visit to this earthly paradise had given me so much pleasure that I improved the opportunity on my return to renew acquaintance with it, and then I had the pleasure to meet Mr.

McClennan, the superintendent, who paid me every attention and drove with me through the park, pointing out objects of interest and explaining his plans for the future development of this Arcadia. The land all around San Francisco is so fertile that it requires no stimulus other than a sufficiency of water to produce the best results, and the water used in this park is all procured from artesian wells, being pumped up to the high grounds.

While here I took occasion to visit Sutro Heights, the seat of Adolphus Sutro, the many times millionaire, whose place adjoins the park. This is one of the most lovely spots that could be imagined, with fine trees of every kind,— *Araucaria Milleri*, *A. Cookii*, *A. Bidwillii*, etc. Dracenas and palms are numerous and all good specimens. Close at hand are the public baths, a grand institution, open free to everyone.

On October 12th, I visited Sherwood Hall, the property of Timothy Hopkins, another elegant place, or rather a place which ought to be one of the finest in the country. But I was shocked to find so fine and noble a house and grounds turned over to commercial uses and the beautiful flowers being sold as if this was no more than an ordinary flower market. Here are some of the finest floral specimens to be found anywhere, with splendid palms, agaves, and other plants. The lawns through the grounds had been broken up and violets planted everywhere. Indeed, I was told that more than eight acres were planted with nothing but violets, six acres with chrysanthemums, and four acres with sweet peas, and pinks and other marketable flowers in like proportion. The Hall had evidently been a grand place when properly cared for, but it is sorrowful to see everything running to decay as it now is. Scattered round the extensive grounds are numerous vases which have cost fabulous sums of money — some as much as five thousand dollars each; and beside these there is quite a large collection of statuary, representing thousands of dollars spent, now all going to ruin.

At the railway station near Sherwood Hall, I saw specimens of *Agave Americana* thirty to forty feet high in flower.

On the day following my visit to the latter place I went to look over one of the great vegetable farms so numerous near San Francisco. There was every sort of known vegetable, and strawberries in profusion. This farm is ten acres in extent, and seemed to be literally dotted over with windmills used for

pumping water from artesian wells, irrigation being the only thing necessary to promote growth, thus confirming what I had previously been told. Indeed it is almost impossible to believe the wonderful stories told of the prolific nature of the soil.

In the evening I had a ramble through the famous Chinatown of San Francisco, taking a guide with me. There I saw such sights as would disgust any person who has respect for his kind. The abodes of these people are simply hovels, and they herd together more like swine than human creatures. Their principal enjoyment consists in opium smoking, while vice is openly carried on, the residents being devoid of all shame. They are allowed to live in this loathsome manner simply because they pay exorbitant rents for the hovels they occupy, out of all proportion to what they are worth. On the top of the shanties they live in, these Mongolians sell Chinese goods and do a thriving trade.

We sailed from San Francisco for Yokohama on October 15th, in the steamer Peru, Captain Ward, of the Northern Pacific Steamship Line. The voyage was a very rough one and I suffered dreadfully from that old enemy of the landsman, sea-sickness. The wind blew from the north-west all the way across and so we were twenty days at sea, allowing for the difference of time, and nine of those days I was too ill to eat anything at all. The officers of the vessel did all they could to relieve the passengers, and were courteous and obliging at all times. Although a very young man, Captain Ward proved to be a capital officer and knew how to command. The weather was so very rough one night that I was violently thrown from my berth to the state-room floor, and the officer of the watch hearing my fall came to the door to enquire as to the port-hole window, which he thought had been blown in, the noise was so loud. Others again thought that I must have received serious injury by the fall. Fortunately there were no bones broken, but I was terribly sore when I picked myself up, and very soon after I was covered with black and blue marks where I was bruised. However, I got over everything all right and was glad to arrive at Yokohama, all well, on November 3d.

To an American or European the first sight of Yokohama is at least interesting. In the background there rises what might seem a forest of trees, for every street gives its quota to the scene, being full of foliage. At the wharf our first astonishment was not to see any horse cars or other carriages such as we had been

accustomed to, but in their place were a lot of curious looking vehicles called rikishas; they are drawn by men who are generally clad in grey or blue clothes of light texture, and in their own tongue or broken English they ask, "Will you ride, Mister?" How hardy these men are none can tell until they have had experience; it is no uncommon thing for them to run forty or fifty miles in a day, and then they come in smiling as though they had not over exerted themselves. They are always cheerful and are glad to get a sum equivalent to fifteen cents an hour. But beware how you treat these poor fellows, for if you try to run them down, to use a Japanese expression, your name is mud. While they will work hard and honestly for you if you treat them well, they will carefully shun those who attempt to take advantage of them and wherever you go in Japan after once ill-treating the jinrikisha man, you will find that your character is known, be it hundreds of miles away. But be honest with them and no better servants ever lived; they will draw you eight or ten miles an hour without a murmur. Horses are seldom seen here except in the carriages of the grandees. The rikisha is the common vehicle and there are thousands in every city. There was no choice and therefore we had to take one of these peculiar vehicles to get to our hotel, the Grand, which is carried on in European style. It is the finest house of its kind in Japan. The servants are all native but they are well trained. In this house the guest can obtain anything he desires, even to home dishes,— Boston baked beans among them.

We arrived at the hotel about ten o'clock in the morning, and after lunch had a look round this city of temples and gardens, and let me say here that everyone seems to have a garden, if it be only in a backyard. I shall have something to say about these later.

While I was in Japan I assure you I made the most of my time; every morning I went out prospecting and so gained much information.

In Yokohama I visited the establishment of Louis Bœhmer & Co., nurserymen and florists, No. 28, Bluff. Mr. Bœhmer very courteously invited me to "tiffin," which I may explain is the Japanese term for lunch. Afterwards he showed me through his extensive grounds and greenhouses. I was very much surprised to see everything in such perfect order, with plants and shrubs of all kinds at their best. Many noble specimens were growing in China vases which were hundreds of years old. There

was also every variety of plants for house or lawn decoration. Here I found a good collection of chrysanthemums of many varieties, but only one which I thought to be extraordinary, and that one I secured. I also obtained a great many valuable plants of other species from the same firm, many of which have arrived, and more are to arrive in April. I was much pleased to meet Mr. Bœhmer's new partner, Mr. Alfred Unger, who was exceedingly attentive to me. This gentleman is a young German and he promises to be a valuable addition to the firm. He is polite, active, and a good business man of considerable knowledge.

From the windows and the veranda of the hotel we could see miles across the bay, with steamers coming and going all the time. Looking to the right there was a magnificent hill covered with foliage, on top of which was a large temple, which I visited early in the morning. As I approached the steps I saw two young maidens who appeared to beckon me to enter. Here I was taught my first lesson in Japanese manners. Judge my surprise when I reached the steps and one of the young girls seized my right foot, and the other took hold of the left, each offering me a slipper to put on. I took my boots off and put my feet into the slippers, which they assisted me to do. Then they bade me enter the temple. I was at once astonished and delighted by the magnificence of the interior. The whole building was surrounded with sculpture of every imaginable kind, representing men, animals, birds, and flowers, all executed in the highest style of art. The whole scene was solemn in the extreme. Leaving this temple I could not avoid noticing two large trees, which proved to be Ginkgo trees, about fifteen feet in diameter and one hundred feet in height to the lowest branches. The effect of the trees, one on each side of the entrance, was grand.

The Cliff Gardens, Yokohama, form only one of many pretty spots near this interesting city; it is a beautifully laid out piece of ground, large in extent and open to the people at all times. There I saw dwarf figures composed of chrysanthemums representing all kinds of character. Here are some elegant specimens of the *Camellia Japonica*, in every shade of color. These composed a hedge of flowers twenty feet high and six feet through, extending about five hundred feet in length. It was really a sheet of flowers when I was there. Then close beside was the *Daphne*

odoratissima eight feet in diameter and full of buds; also beautiful specimens of the Umbrella Pine (*Sciadopitys verticillata*) and other Pines and Gardenias.

While there I paid a visit to the Yokohama Gardeners' Association's grounds, Nos. 21 to 23 Nakamura Street, and there I saw the floral and nursery business carried on in the most perfect manner. This establishment covers two hundred acres of land, including greenhouses and stores too numerous to mention. Palms, pæonies, plums and cherries, evergreens, and all classes of shrubs in cultivation — also magnolias, are here. Besides all these, there are hundreds of thousands of dwarf trees from five to five hundred years old. Truly this is the most beautiful collection of its kind in the world. The chrysanthemums were grand, from six hundred to eight hundred varieties being on view. Among these were about seventy altogether new varieties, which I obtained,— all wonderful in color and shape. The gardeners, although unable to speak more than a few words of English, readily understand when you appreciate their work of cultivation. I visited their gardens several times and was most courteously received. They are great seedsmen. Most of their plants are growing in bamboo baskets or glazed pots so that they are ready for removal at any time. They are dwarf, well rooted, compact plants of all growths.

I visited every place of note in Yokohama where I might expect to find a chrysanthemum, and discovered one or two new varieties in each place. These I generally obtained on the spot, though this is not an easy thing to do at all times. It is impossible to purchase from the gardeners of the gentry. The latter are dignified with the title of noblemen and stand high in the esteem of the people, while they are as proud as the most ancient of the British nobility, and would refuse to sell anything which they have in their handsome grounds. It is, therefore, necessary in some way to become intimate with the gentlemen themselves or to placate the servant. To do this of course one has to use his brains, and a little stratagem when desirous of securing specimens in their possession. Above all else it is necessary to satisfy these people that the transfer is purely a matter of friendship and that you have no intention to use the plants for commerce or otherwise than for your own private collection in another country. They object to all commerce when the garden is concerned, and will not sell even to the dealer of Japan.

In this way I visited nearly one hundred places in Yokohama and saw scores of old and beautiful plants which money could not purchase.

From Yokohama I went to Tokio, the capital of Japan and the residence of the Mikado, with its many temples and grandly wooded grounds, filled with children at play and dapper little mothers, themselves scarcely more than children in appearance, carrying their infants on their backs as though they had no weight; joking and gossiping with each other, the happiest mortals in creation. The palace of the Mikado is a large and handsome structure surrounded by most beautiful grounds. But beside this, there are in Tokio many gardens scarcely inferior; all contain most curious trees and shrubs and are carefully kept. Here I saw one of the best collections of chrysanthemums in Japan. The Imperial gardens are difficult of access; indeed, there is no admittance at all when the Mikado is residing at the palace. However, I managed to obtain the favor of a sight of this great home of the Japanese flower, and feasted my eyes on a vision of beauty for a brief space.

Tokio abounds in elegant parks and drives, and possesses a fine museum which would put to shame many of those seen in Europe. In the great park may be seen almost every animal known, with birds and monkeys innumerable. The Imperial Botanical Garden, is one any country might well be proud of, for there is to be seen one of the largest collections of named plants in the world. While there I met a botanical student with whom I entered into conversation, and he informed me that there were no less than eighteen thousand named varieties in these grounds. He pointed out some beautiful spots laid out in an artistic manner. There were many beautiful palms, and other trees, shrubs, and greenhouse plants.

Dangozaka, the great chrysanthemum garden, is about fifteen minutes' walk from the Uyeno Park, and is situated on the slope of a hill. In this place it has been the custom, from the days of the Tokujiro Shoguns, to arrange chrysanthemum flowers deftly, to represent notable persons, birds, or animals, or to tell of some event in history. As the visitor approaches from the street, flags and banners seem to invite him, and the showmen tell of the great skill they have to show. The visitor pays the fee, a few "sen,"*

* Nine of these coins equal one cent of United States money.

and is led forward by a man who explains the allegory. The costumes of the figures are composed of chrysanthemums; the faces are carved in wood or plaster, the whole being realistic in appearance. The construction of these models is most interesting. First a frame of bamboo of the required size, is made, and the plants, growing in pots, are arranged in the rear of this frame in such a manner that neither stems nor pots can be seen from the front. Then the blooms are drawn through and arranged in artistic fashion among moss on the front of the frame. These models last for about a month, and old and young go to view the show, which is considered one of the great events of the year. Other places which I visited in this vicinity are Megura, Asakusa, Simei-Iriya, Hanka Yen, Senzokumura, and Kusubun-at-Honjo.

On Sunday afternoon, after visiting the chrysanthemum show, and when about half a mile from the palace, I came across a vast concourse of people who were evidently holding a celebration of some kind; there must have been sixty thousand men, women, and children. Horse racing, dancing, and all kinds of games were in progress, and everyone seemed to be delighted. As I got near to the crowd I was surrounded by a host of happy, smiling, little girls who seemed to think I was a modern Gulliver, for they greatly admired my size, which is much above that of the average Japanese. I could not but remark how pretty these little dolls were in their nice, silk dresses, with their hair tastefully braided. In all my experience I never saw so orderly a crowd. There was no jostling or hustling, but all seemed to be willing to help each other enjoy themselves.

I found many curiosities and novelties in Tokio, and that Sunday afternoon as I stood watching those people at play, I procured one of my finest specimens from off a handcart. But it was not until I had done a great deal of talking that I could persuade the man to sell it to me.

In Tokio I came across the lotus gardens, covering seven acres of land. The Lotus is highly prized by the natives. To them it is the symbol of purity, as it grows in the mud but brings forth a lovely flower. A good man, untarnished with the vices of his friends or contemporaries, is called "Deichu no nachisu," or a lotus in the mud. The flower represents, secondly, virtue, as its fragrance sweetens the air in its vicinity; thirdly, it represents single-mindedness, as it has no branches, and fourthly, it represents usefulness, as its root is edible.

From Tokio I went to Nikho, another great city, which stands on the rise of a hill, and is noted for its magnificent temples and its picturesque situation among a range of exceedingly high hills. For a man who loves Nature there could be nothing more delightful than to roam among these mountains, clad as they are with such a wealth of foliage of all shades. These mountains extend for twenty miles, and every step reveals some new wonder. It would be impossible were I to attempt it, to do justice in words to this grand scenery. When I was there all creation seemed to wear its best garb. The trees were all in handsome foliage of every hue; the maples were perfectly magnificent, while palms, rhododendrons, azaleas, hydrangeas, honeysuckles, weigelas, and deutzias, were equally grand, all growing spontaneously together. Hydrangeas, in great variety, over twenty feet in height, were to be seen growing wild. On one mountain side there were twenty-four varieties of shrubs growing in a space of twenty-five feet square. These were so thick that it would have been impossible to get through them. I felt that I should dearly like to spend years in the study of the many grand plants on these mountains, being sure that there were among them many novelties, yet undiscovered by us. On one occasion I came to a grand waterfall on the mountain side, the top of which was a crevice some four hundred feet high. At that time I was being carried in a basket on the shoulders of four men. It was impossible for even the accommodating rikisha to get along here; the foothold was not more than three or four feet wide in places. These men are so accustomed to carrying people up the mountains that their step is as sure as that of a goat. So I was carried up eight or ten miles. The effect of the landscape was glorious in the extreme. In one place two hundred feet below a waterfall, I saw a bush at the foot of the ravine, covered with bright red berries, and at the risk of a fall, I climbed down to see what it was. I found it to be a Barberry bush, but surpassing anything I had ever seen before for the brilliancy of its color, which was a dark carmine or crimson. This was the only plant of its kind I saw, and I procured all the berries or seed. I planted them at home and am glad to say that they seem to be doing well. Near this place there is a Japanese tea-house, an accommodation common all over the country and which takes the place of our own roadside hotel. To this some friends with myself had previously forwarded

substantial refreshment, and a rest and a bottle of lager beer were very enjoyable, with the cool breeze coming from a large lake close by; we were then up some four hundred feet high. This lake is several miles in extent and feeds the waterfalls. One would wonder how so large a volume of water could be gathered from the hills at such an altitude, although the range is from two thousand to four thousand feet in height. On another occasion four jinrikisha men carried me up these mountains, and I picked about one hundred varieties of seeds from plants growing there.

Near the temple of Nikho I saw some fine specimens of *Cryptomeria Japonica.* One morning, going out early, as was my wont, I came to a tea-house, and there saw growing in the yard a magnificent collection of chrysanthemums. There were four pretty Japanese girls sitting on the veranda of the house, and I asked permission to step in to look at a particular flower more closely. At first they seemed afraid to allow me to enter, but soon they not only invited me in, but handed me tea in one of their tiny cups. I praised the flowers and they seemed pleased and offered me some of them. The young girl who seemed to own the flowers, took up the specimen I most admired, retaining only a side shoot for herself, and that she planted where the other had been. I was pleased to get the plant and offered to pay for it, but this she would not listen to, saying she was much pleased to give it to me, and in the hearty fashion of the country told me to call again. In the meantime she had asked my name and gave hers in return, which was Toh Me. I promised to go again in the evening, seven o'clock being agreed upon as the time. Accordingly at that time I went again, but then I was accompanied by some friends who were equally desirous of seeing something of the inner life of the people of the country. When we got there the girls seemed astonished to see that I was not alone. I soon put them at ease, however, by saying they were my friends. Slippers were handed to each, and when we had put these on we stepped into a dainty little room, and tea and supper were handed round. After the ladies had taken a whiff of tobacco from one of their tiny pipes, without which no Japanese girl could exist, they retired. Presently a screen was drawn back disclosing an adjoining room into which directly after, the girls all stepped, but dressed in the flowing dancing costume of the country. Two of the girls sat down in separate corners of the room and played

on the peculiar musical instruments which they use, singing at the same time. The other girls then commenced to dance. But what dancing that was! The highly paid premier dancers who come here year by year from Italy and France, do not compare with these girls in ease and grace. The dance of the Japanese is in itself a poem. It is always intended to represent some phase of life, and is readily interpreted by those who have lived there any length of time. We spent two hours very pleasantly here, an old lady handing round refreshments as the entertainment progressed, and when we left it was with the request to come again.

From Nikho we went to Mineosta, then to Shidyawa and Yogoya, finally arriving at Kioto, where we stayed a week. This is one of the finest cities of Japan, and it was here we found the best chrysanthemums. They were to be seen in every garden, and I secured some very handsome varieties, among which are many of an entirely new class. Here I visited some of the great rice farms and the noted orangeries, together with some of the great mountains. This place, like all Japanese cities, has many handsome temples; and one, which is in course of erection, has already cost over $6,000,000. It is a most wonderful structure, with immense arches enriched with delicate carving of every conceivable kind, including many floral designs of most poetical conception. Around this temple again are shrines erected to the memory of departed friends, and these are equally elaborate in their decoration.

On one of the farms near here, I saw no less than eight acres of *Lilium auratum* bulbs and five acres of *Caladium esculentum* roots, sweet potatoes, buckwheat, and four acres of lotus. The farmer claimed to have thirty varieties of lotus and I secured some of each, although the nurserymen and city dealers do all they can to prevent strangers dealing directly with the grower.

In another place I saw six acres of pæonies of all ages, and three acres covered with young plum, cherry, and peach trees in all stages. These were being grown for shipment. Persimmons were plenty and mulberry trees were grown by the acre. The latter were cultivated for the rearing of silkworms, which is a great industry in this neighborhood. In the ravines between the great mountains here, the ground is perfectly yellow with the fruit of orange trees.

While I was in Kioto I went to Sacco, about one hundred miles distant, to visit the finest chrysanthemum show in Japan. Sacco is a very large city, all laid out in squares, the streets running in perfectly straight lines for four miles, from north to south, each from fifteen to twenty feet wide, with equally straight cross streets. This arrangement gives the place a very neat appearance, the houses being low and built closely together. In the show there were thirty different classes of chrysanthemums, all arranged in booths built of bamboo, each class by itself. Specimen plants were grown in almost every conceivable shape, showing remarkable skill in cultivation, four or five kinds being grown in one pot, and trained to make a perfect pyramid of flowers of different colors. Few people can realize how surprised I was to see this marvellous display, after all the many wonderful shows I had seen in Japan. The varieties and classes were perfectly gorgeous, and so grand that I could not have believed such an effect possible. After a careful examination and deciding in my own mind what I should like to take away, I asked if I could purchase any. At first I was refused, but after considerable talk and when I had convinced the people that I wanted them for private use and to take out of the country, making a solemn promise to that effect, I was told I might have some. I began to point out such as I should like from those in the exhibition, but I was told that I could not take any of those on view, but must select from others growing on a plot of land in the rear of the exhibition, where there were the same varieties in the open air. Imagine my further astonishment when a bamboo gate was opened and I saw over a quarter of an acre of land literally covered with plants, all named, two or three of every kind and more of some. Many of these plants were from seven to eight feet high, with flowers from seven to fourteen inches in diameter. The gentleman who owned the place was old and feeble, and his wife sent the head gardener to accompany me while I made my choice. I went over the whole place row by row to all the classes and when I had got through I had no less than one hundred and seventy-five varieties. I returned to Kioto very much pleased as you may suppose, and hastened to Yokohama once more to get my treasures safely started off for Boston. I had by this time gathered in all about four hundred varieties of chrysanthemums, beside other plants. Among these were one hundred varieties of maple, seventy-five

varieties of tree pæonies, fifty varieties of herbaceous pæonies, fifty varieties of plums, fifty varieties of cherries, fifty varieties of flowering peaches, six varieties of hydrangeas, one of these being the rarest plant in Japan; numerous varieties of ornamental trees, some of which are fifty, one hundred, and two hundred years old, with twenty varieties of lilies, besides lotuses, rhododendrons, azaleas, magnolias, evergreens in great variety, wistarias, citron and orange trees, and six varieties of bamboo. Some of these I brought with me and the remainder I expect to arrive next month.

I left Yokohama on my return journey November 29, again sailing in the Peru, after I had seen all my plants on board. One palm I carried aboard in my hand and brought in my stateroom, along with a pretty little Japanese dog, which some friends had given me while in the mountains. We had a pleasant voyage and I arrived in San Francisco in fifteen days. After seeing my plants on the train there, *en route* for Boston, I remained two days in that city. I then left for Pasadena by the Southern Pacific route, and there I stayed at the magnificent Raymond Hotel, which is under the management of Colonel Wentworth, who was formerly at the White Mountains. This hotel is situated on a hill with vast mountains on the one side, and a valley extending for miles on the other. For many miles before you reach the hotel this huge mountain can be seen. The Raymond is a spacious house, elegantly furnished and fitted with the most approved modern conveniences, and possesses a splendid staff of servants. It is a place where any one will feel at home. Here I met Mr. Charles H. Hovey—son of the late Mr. Charles M. Hovey, of Cambridge—who is the Superintendent of the extensive grounds and greenhouses. He was pleased to see a Boston face in his far away home, and took pleasure in showing me over the grounds, which are beautifully laid out with forest trees and ornamental shrubs, and also groves of Navel orange trees, many of which are fine specimens. In the grounds I saw many varieties of carnation pinks, larger and of a better color than any I had ever seen before. These were all of his own raising. Here, too, were many hundreds of American Beauty roses in perfection. One greenhouse was filled with cinerarias, which reflected great credit upon the skill of Mr. James Barratt, the gardener, who was formerly with the late Mr. Charles M. Hovey. There were also

some fine cypripediums and other orchids. The whole place was in excellent condition and did credit to the management. Mr. Raymond has expended a large amount of money on this hotel and everything about it is of the very best. Here I saw some wonderful specimens of palms growing out-doors. Mr. Hovey, on the second day of my stay, invited me to accompany him in a drive to Los Angeles, which proved to be a treat. This is comparatively a new city, only fifty years old, and yet there are many beautiful trees and palms there—Araucarias from thirty to forty feet high, and palms from twenty to thirty feet high—with a great variety of other trees and shrubs, which all seem to thrive. Altogether I was delighted with my visit to this pretty place.

I arrived at Chicago, December 20th, and at once proceeded to Boston, which I reached in a miserable snow-storm. After so recently leaving a tropical climate, where the average temperature during my stay was sixty-five degrees, the change was great, I assure you.

Japan is a paradise for travellers. There everyone has an opportunity to practice the lost art of politeness, for civility is a common virtue, even among the lower classes. I mastered sufficient of the language in five days to get along pretty well, and make myself understood; although the peculiarity of the rather discordant dialect is such that you can learn it one day and forget it the next more easily than anything else I know of. The guide books are excellent, and the jinrikisha men are most faithful and intelligent attendants. A rikisha is a two-wheeled conveyance, after the style of an old English gig, and is drawn in a comfortable and rapid manner by a native, who is at once driver and motive power, your guide, your servant, your loyal adviser and friend. Europeans too often go to Japan with an idea that the native is something inferior to themselves, and so they treat them much as they might a dog; but the Jap is quick to detect this, and he will resent it. On the other hand if you treat them with due respect they discover that as quickly, and then they will do anything in their power to please. They are wonderfully keen in their discrimination of human character, and will not make friends if not satisfied on a first introduction.

The Japanese men dote on women. The latter are exceedingly submissive, attentive to your wants, and pleasing in manner; they are shy, demure little dolls, and seem to be always happy.

They make excellent housewives. On several occasions I was invited to take tea with Europeans who have taken unto themselves Japanese wives. In each of these cases I found the children well educated in English and music, and the mothers very accomplished. One Scotch gentleman who had married a Japanese woman had a pretty little family, two girls and a boy, and I was surprised to find how well they were educated.

The home in Japan is very sacred, no stranger or foreigner is allowed to enter there. You may go to their residence and visit certain rooms, but you will never be allowed to put your foot into the inner sanctuary. There are in Yokohama alone some six thousand Europeans, and many of these are married to natives, although it is but little over thirty years since foreigners were first allowed to settle there. The guides are particularly interesting in their way, but like the guides of European countries they have learned their lesson and repeat it parrot fashion, and like those of other countries often point out what they call wonderful things, but which are anything but such. When I was at Nikko the guide said he would show me a tree I had never seen before. This turned out to be a camellia, about twenty feet in height, which was completely covered by mistletoe. Truly it did look peculiar, but when I told the man what it was he seemed to be dreadfully put about.

The theatres of Tokio are grand, and I was surprised by the size and beauty of the Imperial Opera House, which I visited, and was equally pleased with the music and dancing. The Imperial box, in which we sat, faces the stage in the middle of the house. and below it is a range of smaller boxes in each of which is seen the everlasting little stove for making tea. I was greatly amused when there to see a Japanese just below me in one of the smaller boxes — he was a large man for a native, but nothing like my weight — standing up and beckoning me to go to his box. He drew the attention of the whole house to our box by his antics and his calling out to me, "You big, you big." Of course I did not go down to him, but directly after two pretty little girls, who were with the big Jap, came up to our box and sat down one on each side of me and remained there through the performance, laughing and joking, and seemed greatly to admire my corpulence.

The Japanese gardens are the most fairy-like places. You see there growing tiny trees and flowering plants, diversified with

ponds, bridges, paths, summer houses, lanterns, and all things necessary to make the scene beautiful. Here are dwarf pines, six or eight inches high, known to have existed one hundred and twenty-five years, and others a foot high and five hundred years old. In the garden of Yeiju-in, standing within the temple grounds, there are many pæony plants, mostly old, but one which is one hundred years of age. It is about eight feet high and is quite a tree.

Most of the soil of Japan is a rich peaty loam, but this is interspersed with a yellow, light clayey soil. Both these are extremely fertile, and in each there seems to be planted that which is peculiar to the ground. The fertilizer most commonly used is rice straw cut into small pieces as though it had been through a hay cutter; but the people depend almost entirely upon the irrigation from the rivers, the soil being most prolific. Yet it is most carefully cultivated. A weed or a waste piece of land will not be seen in a long railway journey. The farmer seems to utilize every bit of land in his possession. The farming instruments, however, are very crude. A spade is never seen, and the only implement is the big bog hoe, with a blade about four inches wide. The ground is light, and after turning it over with the hoe it is left for two or three days, exposed to the sun. Then it is levelled down and the seed sown. Everything but rice is carefully planted in straight rows. Occasionally one may see a black bull hitched to an ancient looking instrument, which is dignified by the name of plough, but it is so small that it looks more like a toy than anything else. Women and men are engaged in the fields, and while I was there they were harvesting rice. The manner in which they threshed the rice was singular. Women and young children draw the straw across what seems to be a saw on a saw horse and the teeth caught the rice and separated it.

It is a matter of some wonder to our own gardeners how the Japanese curtail the growth of their plants as they do, while we find pleasure in increasing their size. There is as much art in keeping down the growth, and having dwarf plants, as in extending the growth. After consideration and noticing the plants in Japan, my opinion is that the glazed or marble pots they use, and which are not porous, retain moisture longer without watering, and it is not necessary to repot so often. I mean to test this by experience. If you ask a Japanese how he does this, he

immediately avoids the question and turns to something else. How they do manage to keep down the plants to this small size is a matter of conjecture only. But I noticed that all over Japan they use very finely sifted soil for potting, and make it very firm and tight round the roots. They seem to understand the true art of watering, and this, it appears to me, is the main secret of their success.

Nature and art go hand in hand in Japan. The people never try to appear to be other than they are, and never force things. By this I mean there is none of that eternal rush we have here. The native takes things easy and never hurries. They are a clever and industrious people. They are perhaps the cleanest in the world, and take their bath two or three times a day, with the water almost at boiling heat, and this is practised as much in the country as in the cities. The bath tub is everywhere. During my visit I went through several silk and vase factories and was surprised to see the beautiful specimens of work done, even by children of only five to ten years old. They were making vases and other porcelain ware which would take as long as eleven months for the completion of a single piece, because of the amount of labor, and the time necessary to dry the work at each stage. They are equally clever in needle-work.

If tourists wish to renew their life, I should say by all means go to Japan instead of Europe; there they may have enjoyment and rest. Besides, the beauty of the country has no end. Long as I have cultivated the chrysanthemum I had never seen a flower until I went to Japan, where everyone loves it. I visited five hundred places where the flower is cultivated, and these were only the principal gardens in a few of the large cities.

I do not desire that anyone should think by my reading this paper that I want to say I have seen Japan. I have only seen what is comparatively a very small portion of that wonderful country. Some people speak of going to Japan and having seen it, but too often they have only had a glimpse of it. You do not see Japan by looking through its temples, or riding over its mountains, grand as they are. You need to go among the people — among all classes, and into the backyards as well as the front-yards to find what there is to know. In the most unlikely places you will find the most curious novelties. It is the same in the country, among the rice fields, and there you will meet what may

be termed the lowest stratum of society. But go where you will you will find politeness and a refined manner, even among the humblest. It seems to be born in them; especially is this the case with the women, who always answer you with a smile and a bow.

If I have afforded my hearers any pleasure, I can only say I feel repaid for any trouble I have been at in preparing this paper. On the table will be seen photographs of some of the places I visited in Japan, which are open to your inspection. From time to time I hope to be able to show in this room some of the results of my trip to Japan.

A number of photographs of Japanese persons, travellers, the rikisha, views, colored drawings of plant leaves; a large screen of intricate design in needle-work, done by children of ten to twelve years of age; a living plant of Sago Palm, one hundred and twenty-five years old, in a pot — about seven inch — in which it has been kept during the last fifty years; also a very pretty and engaging little Japanese dog, were exhibited by Mr. Comley, as illustrations of points in his paper.

O. B. Hadwen, the Chairman of the Committee on Discussion, announced that this was the last lecture of this course. On his motion, a vote of thanks to Mr. Comley, for his graphic and very interesting lecture, was unanimously passed.

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Experiment Station Reports Wanted.

The Massachusetts Horticultural Society is endeavoring to collect complete sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, Boston.

A considerable number of duplicates are on hand, which will be exchanged for any of those in which the Society is deficient.

Alabama (Ag. and Mech. College Station). — Bulletins 1, (1883), 2–6, (1884), 7–10 and 1–4, (1885), 5–9, (1886), 2, 3, 5, and 6, (1887), and 1, (Jan. 1888). Third Annual Report.

Arizona. — First Annual Report.

Arkansas. — Bulletins 1 and 4.

California. — Bulletins 1, 2, 3, 5, 50, 66.

Colorado. — Bulletin 3.

Connecticut (New Haven Station).—Bulletins 1 to 67, inclusive. Annual Reports for 1877 to 1883, inclusive.

Indiana (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1 to 14, inclusive.

Kentucky. — Bulletin 10.

Maryland. — Special Bulletin G.

Massachusetts (Hatch Station).— Meteorological Bulletin 5.

Minnesota.—All Reports previous to the Biennial Report for 1885 and 1886.

Missouri.— Bulletins 9, 13, 15, 16, 17, 19, 20, 22, 25, 26, 28, 29, and 33 of Old Series. All annual Reports since the first, for 1888.

New Jersey.— Bulletins 1, 4, 5, 15, 27, and 28.

North Carolina.— Bulletins 1 to 56, inclusive, 62½, and 69, 2d ed. Meteorological Division, Bulletin 2 (68*b*), and 2d and 3d Annual Reports, for 1888 and 1889. Special Bulletins 1 (77*a*) and 4 (82*a*).

Nebraska.— Bulletins 22 and 23.

North Dakota.— Bulletin 3.

Ohio.— All Bulletins of First Series.

South Carolina.— All Bulletins of Old Series. Third Annual Report.

Tennessee.— All Bulletins of Old Series (beginning in 1882 and ending in 1887).

Texas.— All Bulletins of Old Series.

Vermont.— Bulletin 3.

Ottawa, Ont., Central Experimental Farm.—Dairy Bulletin 2.

Toronto, Ont., Bureau of Industries. — Bulletins 1 to 21, inclusive.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1893.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1894.

☞ SEE LAST PAGE OF COVER.

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TRANSACTIONS

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Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 1, 1893.

A duly notified Stated Meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

George E. Davenport announced the decease, on March 28, of E. H. Hitchings, of whom he spoke as a most valuable and valued member of the Society; who had been one of the most conspicuous figures in it, and who had done much to educate the community in a knowledge of native plants. He moved that a committee of three be appointed to prepare a memorial of Mr. Hitchings. This motion was carried, and the Chair appointed as that Committee, Mr. Davenport, Edwin Faxon, and Mrs. P. D. Richards.

On recommendation of the Executive Committee

Hon. J. STERLING MORTON, of Washington, D. C.,

Secretary of Agriculture, was elected an Honorary Member of the Society.

B. E. FERNOW, of Washington, D. C.,

Chief of the Division of Forestry, U. S. Department of Agriculture, and

WILLIAM TRELEASE, of St. Louis, Mo.,

Director of the Missouri Botanic Garden, were elected Corresponding Members of the Society.

H. A. SIEBRECHT, of New Rochelle, N. Y., and

Mrs. S. H. COLEMAN, of Jamaica Plain,

having been recommended by the Executive Committee as members of the Society, were on ballot duly elected.

The Secretary read a letter addressed to the President by Samuel Henshaw, Secretary of the Boston Society of Natural History, inviting the members to attend a lecture before the Society of Natural History, by Professor George L. Goodale, on Wednesday evening. The thanks of the Society were voted for this kind and courteous invitation, and it was also voted that the card accompanying it be posted in the Library Room.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, stated that the Committee would be obliged to those having in mind subjects which they deemed proper for consideration at the next season's meetings for discussion, if they would leave a memorandum of such subjects with the Secretary of the Society.

Adjourned to Saturday, May 6.

BUSINESS MEETING.

SATURDAY, May 6, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

Hon. George M. Brooks, of Concord, was proposed by Charles E. Richardson as a Life Member of the Society.

O. B. Hadwen, Chairman of the Committee on the Columbian Exposition, read a report of the doings of the Committee, and asked that the Committee be discharged, and that the Treasurer of the Society be directed to pay such bills for necessary expenses incurred, as should be audited and approved by the Committee. It was voted that the report be accepted and the Committee discharged, and that the Treasurer pay such bills for necessary expenses as should be approved by the Committee.

George E. Davenport, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Ebenezer H. Hitchings, read the following:

Preamble and Resolutions of the Massachusetts Horticultural Society on the death of Ebenezer Herring Hitchings.

On Tuesday, March 28, 1893, and on his eighty-fifth birthday, there passed from this life, a member of the Massachusetts Horticultural Society, who for many years has been a conspicuous figure in the rooms of the Society, and whose instructive exhibitions of native plants have not only made his name widely known and dear to all lovers of Nature's floral beauties, but whose earnest enthusiasm, communicating itself to others, made for him a host of friends who will cherish his memory so long as they live.

Such was the freshness and buoyancy of his spirits, and the strength of his love for Nature's charms, which seemed to increase with increasing years, that some of us, although not unmindful of the inevitable certainty of the summons which, sooner or later, comes to us all, had come almost to believe that somewhere, during his intercourse with Nature, he had indeed discovered the fountain of perpetual youth, whose magical waters had given to him exemption from the common lot of man.

But we are awakened from this dream to the reality of that which we call Death, and today we are here to pay our tribute to our friend, whose taking away came to us with all the suddenness of the shock which comes to one from the unexpected death of some dear one suddenly, in all the strength of youth.

But he has left to us a precious legacy, in the lesson of his life, and those of us who, like him, love the wild flowers and Nature, may point with pride to the loveliness of his declining years and exclaim: Behold the influence upon the human soul of that which beautifies old age and makes life worth the living even to the end!

To the Massachusetts Horticultural Society the loss of such a man as he whose death we now deplore, with his immeasurable influence for good in the educational direction of its work, is so great — leaving as it does, a void which it will be difficult to fill — that we can only feebly express our deep sense of it in any resolutions we may frame and place upon record.

Desiring, however, to show in some manner our appreciation of the life work of our departed brother member, and to pay that tribute of respect due to his memory, we do hereby

Resolve, That it is with feelings of the profoundest sorrow that the Massachusetts Horticultural Society records the death of Ebenezer Herring Hitchings, an old and valued member of the Society, whose unflagging interest in its welfare characterized his

long and useful membership, and whose constant and earnest endeavors to create an interest in, and love for our native plants, and to disseminate throughout the community a knowledge of the rare and choice things to be found in Nature, through the medium of frequent exhibitions of the best in their seasons, from year to year, gave to the service of his membership an unusual importance and value, thereby making his loss all the greater. Therefore, be it also

Resolved, That this Society, while thus recording its sorrow for the death of Mr. Hitchings, furthermore desires to place upon record its appreciation of the character of the MAN, the value of his membership and its sincere respect for his memory.

Resolved furthermore, That a copy of the Preamble and these Resolutions be sent to the family of the deceased, as an expression of the sympathy of this Society with them in their bereavement.

GEORGE E. DAVENPORT,
EDWIN FAXON,
JOSEPHINE L. RICHARDS, } *Committee.*

The adoption of the Resolutions was seconded by John C. Hovey, who spoke of Mr. Hitchings as the first botanist placed on the Flower Committee, and one of the first to exhibit native plants, persevering in the work until their exhibition had reached its present extent. Mr. Hovey concluded by expressing the hope that in the future there may rise up those who will make his place good.

On putting the question on the adoption of the Resolutions the President called for a rising vote, and they were unanimously thus adopted.

WILLIAM B. S. DOWSE of West Newton,

having been recommended by the Executive Committee as an Annual Member, was on ballot duly elected.

Adjourned to Saturday, June 3.

BUSINESS MEETING.

SATURDAY, June 3, 1893.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

In the absence of the Secretary, the President appointed Miss Charlotte M. Endicott Secretary *pro tem.*

The following named persons, having been recommended by the Executive Committee as Members of the Society, were on ballot duly elected:

Thomas H. Lord, of Boston.
Hon. George M. Brooks, of Concord.
Charles N. Carter, of Boston.
Mrs. Nancy J. Bigelow, of Southborough.
Thomas E. Pigott, of Winthrop.
William C. G. Salisbury, of Brookline.
W. Clifford French, of Boston.

The meeting was then dissolved.

BUSINESS MEETING.

Saturday, July 1, 1893.

A duly notified Stated Meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society make an additional appropriation of one hundred dollars for the use of the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee. The report was accepted and the appropriation was unanimously voted.

The Secretary read circulars from Col. Albert A. Pope, concerning the improvement of roads. After discussion it was voted that the President of the Society be authorized to petition the Senate Committee of Congress, setting forth the importance of good roads in relation to agriculture, and asking the Committee to consider the expediency of legislation by Congress for the improvement of roads.

The Secretary announced the receipt of a letter from Hon. J. Sterling Morton, of Washington, D. C., Secretary of Agriculture,

acknowledging and accepting the Honorary Membership in this Society to which he had been elected; also letters from B. E. Fernow of Washington, D. C., Chief of the Division of Forestry, United States Department of Agriculture, and William Trelease, of St. Louis, Mo., Director of the Missouri Botanic Garden, acknowledging and accepting the Corresponding Memberships in this Society, to which they had been elected; and a letter from Dr. George King, Superintendent of the Royal Botanic Garden, Calcutta, acknowledging the receipt of his Diploma as a Corresponding Member of this Society.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Jabez A. Sawyer, of Cambridge.
William C. Barry, of Rochester, N. Y.
Col. Richard F. Barrett, of Concord.

Adjourned to Saturday, August 5.

BUSINESS MEETING.

Saturday, August 5, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate candidates for officers and standing committees of the Society for the next year:

William H. Spooner, *Chairman*.

J. D. W. French,	E. W. Wood,
John G. Barker,	Arthur H. Fewkes,
Samuel Hartwell,	Benjamin M. Watson, Jr.

The Secretary read an invitation to the Society, from the Australian Association for the Advancement of Science, to attend their meeting at Adelaide, South Australia, commencing September 25, 1893. The thanks of the Society were voted for the invitation.

Miss SARAH PARKER, of Roxbury,
having been recommended by the Executive Committee as a member of the Society, was upon ballot duly elected.

Adjourned to Saturday, September 2.

BUSINESS MEETING.

SATURDAY, September 2, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

William H. Spooner, Chairman of the Committee appointed at the last meeting to nominate candidates for officers and standing committees of the Society for the year 1894, reported a printed list, which was accepted. It was voted that the Committee be continued, and requested to nominate candidates in place of any who might decline before the election.

JOHN C. PAIGE, of Boston,
having been recommended by the Executive Committee as a member of the Society, was on ballot duly elected.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 7, 1893.

A Stated Meeting of the Massachusetts Horticultural Society, being the Annual Meeting for the choice of Officers and Standing Committees, was holden today at eleven o'clock, the President, NATHANIEL T. KIDDER, in the chair.

The Secretary stated that the meeting had been duly notified to the members of the Society agreeably to the Constitution and By-Laws.

On motion of William H. Spooner, it was voted that the polls be opened and kept open two hours.

Mr. Spooner as Chairman of the Nominating Committee made the additional report that the Committee had nominated Augustus Parker as Vice-President, and Augustus Hemenway as member of the Finance Committee,— both in place of Frederick L. Ames, deceased. The report was accepted.

Agreeably to the Constitution and By-Laws, the President appointed William H. Hunt, O. B. Hadwen, and Samuel Hartwell a Committee to receive, assort, and count the votes given, and report the number. The polls were opened at a quarter past eleven o'clock.

While the voting was in progress a letter from James Boyden was read by William C. Strong, offering, in behalf of Miss Simpkins, of Yarmouthport, a Silver Cup, of the value of forty dollars, to be awarded as a prize for the best twelve blooms of any pink Chrysanthemum, other than Pompon, the stems to be not less than two feet long, and the exhibit to be made in one vase at the Chrysanthemum Show, November 7–10. It was voted that the thanks of the Society be presented to Miss Simpkins for this liberal prize, and that the Secretary prepare a circular announcing it, to be sent to chrysanthemum growers.

The President made the official announcement of the death of Frederick L. Ames, whom he spoke of as a valuable friend of the Society, and as one known the world over as a lover of horticulture. On motion of Mr. Spooner it was voted that Professor Charles S. Sargent, Dr. Henry P. Walcott, and Francis H. Appleton be a Committee to prepare an expression of the feelings of the Society in regard to the death of Mr. Ames.

The following named persons, having been recommended by the Executive Committee as members of the Society, were upon ballot duly elected:

Henry Sargent Hunnewell, of Wellesley.
Philip Codman, of Brookline.
John George Jack, of Jamaica Plain.
Albert A. H. Meredith, of Milton.
Archibald Smith, of Somerville.

The following named persons were proposed as members:

Ellerton P. Whitney, of Milton, by Nathaniel T. Kidder, as a Life Member.

Charles Eliot, of Milton, proposed by Nathaniel T. Kidder, as a Life Member.

William Christie, of Newton, proposed by Charles N. Brackett, as a Life Member.

The polls were closed at a quarter past one o'clock, and the Committee to receive, assort, and count the votes, and report the number given, reported the whole number to be forty-six, and that the persons named on the ticket reported by the Nominating Committee had a plurality of the votes cast.

The report of the Committee was accepted, and the persons reported as having a plurality of votes were, agreeably to the Constitution and By-Laws, declared by the President to be elected Officers and Standing Committees of the Society for the year 1894.

Adjourned to Saturday, November 1.

BUSINESS MEETING.

Saturday, November 4, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

The following named persons were proposed as members of the Society:

Desmond Fitz Gerald, of Brookline, proposed by Nathaniel T. Kidder.

Francis H. Peabody, of Boston, proposed by Nathaniel T. Kidder, as a Life Member.

F. Tracey Hubbard, of Cambridge, proposed by Edward L. Beard, as an Annual Member.

Francis Blake, of Weston, proposed by Benjamin M. Watson, Jr., as a Life Member.

Francis H. Appleton, from the Committee appointed at the last meeting to prepare an expression of the feelings of the Society in regard to the death of Frederick L. Ames, presented the following:

Frederick Lothrop Ames,
Died September 13, 1893.

Your Committee to whom was assigned the duty of preparing a Memorial of the late Hon. Frederick Lothrop Ames, to be placed upon our records, respectfully submit the following tribute:

In 1865 Mr. Ames became a Life Member of our Society, and he has taken a prominent part in promoting the objects for which the Society was founded, in collecting, raising, and importing, in great variety; in contributing largely to our exhibitions, and in giving of his knowledge and good judgment, while an important officer since 1879.

It was largely, but by no means exclusively, through his wide knowledge of orchids, and his wonderful collection of them — probably the finest — that he was known throughout the horticultural world. His ambition and success in establishing that noted collection, surrounded in his glass houses by much of rare horticultural beauty and in great variety, has resulted in having the fame for this work credited not alone to Mr. Ames and his own State, but also to our Nation. Honor to the man whose work brings honor to his country!

Let us recall that this Society has been built up from small beginnings, and has reached its present standing by the energy, loyalty, and zeal of its members, guided by a wise and careful regard for a safe and high standard as to its financial policy, until it has become a movement of usefulness and a source of great pride, not only to all its members, but to persons of every degree of horticultural taste, whether directed in the lines of business or recreation.

It is largely due to Mr. Ames' guardianship of the careful financial policy, which this Society has constantly maintained from the beginning, that its usefulness in protecting and promoting all horticultural interests is so great. He regarded the welfare of this Society from a high and sound standpoint, knowing well that constant improvement is the only principle under which that standard can be maintained.

Mr. Ames was a member of the Executive Committee from 1879 until and including 1892, and a member of the Finance Committee from 1882 until the time of his death. He was a faithful and diligent servant of the Society upon this latter Committee, having its greatest usefulness always at heart. He was a Vice President from 1886 until 1891, and also in 1893.

His love of rural life in all its varied forms, and his interest in its development, made him a valued member. His generosity

in the promotion of botanical research at Harvard University should be appreciated by all horticulturists. The knowledge that he possessed of the details of horticultural management would be recognized as remarkable, especially when his extensive business responsibilities are borne in mind.

His loss to our Society is great, and in recognition of his faithful and useful services as an officer and member, we recommend that these expressions be placed upon our records, and that a copy be sent to the family of our late associate.

CHARLES S. SARGENT,
HENRY P. WALCOTT, } *Committee.*
FRANCIS H. APPLETON,

The report was unanimously accepted and adopted.

The President, as Chairman of the Executive Committee read the following report:

At the regular meeting of the Executive Committee held Oct. 26, 1893, it was unanimously voted to recommend to the Society to make the following appropriations for prizes and gratuities for the year 1894:

For Plants,	$2,000
" Flowers,	2,500
" Fruits,	1,800
" Vegetables,	1,100
" Gardens,	500
Total,	$7,900

The report was accepted, and, agreeably to the Constitution and By-Laws, was laid over for final action at the stated meeting on the first Saturday in January, 1894.

William H. Spooner stated that important matters would come before the Finance Committee during the present year, and moved the election of Augustus Hemenway, to fill the vacancy caused by the death of F. L. Ames. Mr. Hemenway was accordingly elected.

The following named persons, having been recommended by the Executive Committee as members of the Society, were upon ballot duly elected:

Ellerton P. Whitney, of Milton.
Charles Eliot, of Milton.
William Christie, of Newton.
William Endicott, Jr., of Boston.

Adjourned to Saturday, December 2.

BUSINESS MEETING.

Saturday, December 2, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

John G. Barker, Chairman of the Committee on Gardens, reported the awards made by that Committee during the present year, and asked further time to prepare the remainder of the report. The report was accepted and further time was granted.

Arthur H. Fewkes, Chairman of the Committee on Flowers, reported the amount awarded by that Committee in Prizes and Gratuities to the present time, and asked further time to prepare the remainder of his report. The report was accepted and further time was granted.

E. W. Wood, Chairman of the Committee on Fruits, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication.

Joseph H. Woodford, Chairman of the Committee of Arrangements read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication.

William C. Strong moved that a committee of three be appointed by the Chair, to take proper notice of the death of Ex-President Parkman. The motion was carried, and the Chair said that he would announce the committee at the next meeting.

On motion of William H. Spooner it was voted that when the Society adjourn it be for two weeks.

E. W. Wood, Chairman of the Committee on Establishing Prizes, reported the Schedule of Prizes for the year 1894, as

prepared by that Committee. On motion of Mr. Strong it was voted that the Schedule be laid before the Society in print at the next meeting.

The Secretary read a letter from Ernst H. Krelage, of Haarlem, Holland, presenting to the Library, as a souvenir of the visit which he paid to it a short time ago, a rare book (which was laid before the Society) on the Culture of Hyacinths and other bulbs. The thanks of the Society were voted to Mr. Krelage for this donation.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society:

Desmond Fitz Gerald, of Brookline.
Francis H. Peabody, of Boston.
F. Tracey Hubbard, of Cambridge.
Francis Blake, of Weston.
Frederick Cole, of Wellesley.
Theophilus D. Hatfield, of Wellesley.
Warren J. Robinson, of Somerville.
Thomas J. Rowland, of Nahant.

Adjourned to Saturday, December 16.

BUSINESS MEETING.

Saturday, December 16, 1893.

An adjourned meeting of the Society was holden at eleven o'clock, the President, Nathaniel T. Kidder, in the chair.

The President announced the Committee to prepare a memorial of Ex-President Francis Parkman, as Ex-Presidents Henry P. Walcott, William C. Strong, and William H. Spooner.

Arthur E. Whitney, of Winchester, was proposed by Robert Manning, as a Life Member of the Society.

Nathaniel I. Bowditch, of Framingham, was proposed by J. D. W. French, as a Life Member of the Society.

The Schedule of Prizes for 1894 was, agreeably to the vote passed at the last meeting, laid before the Society in print. After some discussion and amendment it was adopted and referred back to the Committee on Establishing Prizes, to fix the date of the Spring Exhibition, with full powers.

Dr. Walcott, Chairman of the Committee to prepare a memorial of Ex-President Parkman, reported the following:

Francis Parkman died at Jamaica Plain, November 8, 1893.

Literary societies have already fitly commemorated the loss of our greatest historian; our oldest university has publicly rehearsed to a younger generation the lessons of the life of the scholar who, conquering a frail and suffering body, carried to completion the great work which in youth he had selected for the labor of a lifetime.

The Massachusetts Horticultural Society here records its loving remembrance of one of its most active and interested associates.

He was for three years the energetic and wise President of this Society. He practised the art of gardening with a success rarely equalled by those even who have devoted their lives to that occupation. He was the first Professor of Horticulture in the University at Cambridge. He introduced to cultivation in this country many new and attractive plants. He produced new varieties in the lily and the poppy, which will long adorn the gardens of the world, and he wrote one of our most useful books on the rose and its culture.

No man gave to the art, to the encouragement of which this Society is dedicated, a more loving or devoted service.

For the Committee,

H. P. Walcott.

December 16, 1893.

After remarks by Mr. Strong, of the Committee, the memorial was unanimously adopted, and it was voted that it be entered on the records of the Society, and that a copy be sent to the family of Mr. Parkman.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the annual report of that Committee.

William E. Endicott, Chairman of the Committee on the Library, read the annual report of that Committee.

Robert Manning read his annual report as Secretary and Librarian.

These three reports were severally accepted and referred to the Committee on Publication.

Francis H. Appleton moved that a committee be appointed, agreeably to the request in the Report of the Library Committee, to obtain an estimate of the cost of extending the gallery in the Library Room, around the Librarian's room. At the suggestion of the President the vote was amended so as to refer the matter to the Executive and Finance Committees, who were already charged with the consideration of the subject of better accommodations for the Exhibitions and Library. As thus amended the vote was unanimously carried in the affirmative.

The Annual Report of the Committee on Flowers was submitted by the Secretary, who read a note from Arthur H. Fewkes, Chairman, stating that he was too ill to attend the meeting. It was voted that the reading of the report be postponed until the next meeting.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS,

FOR THE YEAR 1893.

By DAVID ALLAN, Chairman.

During the year 1893, the sum of $1,686 was awarded in Prizes and Gratuities for Plants, leaving an unexpended balance of $314.

March 4, Jackson Dawson, of the Arnold Arboretum, was awarded a Silver Medal for a new first-class Rose,—a hybrid between Gen. Jacqueminot and the single *Rosa rugosa*.

At the Spring Exhibition, March 21–24, a Silver Medal was awarded to Francis Brown Hayes for *Cycas revoluta*.

June 13, a Silver Medal was awarded to F. Sanders, of St. Albans, England, for *Dracœna Sanderiana*.

July 29, Hon. Joseph S. Fay received the award of a Gold Medal for Superior Cultivation of Hydrangeas.

At the Annual Exhibition of Plants and Flowers, September 6 and 7, Silver Medals were awarded to George McWilliam for display of *Caladium argyrites*; Nathaniel T. Kidder for *Davallia Fijiensis*; Joseph H. White for *Nephrolepis exaltata*; and Pitcher & Manda of Short Hills, N. J., for *Araucaria excelsa compacta*, a grand evergreen sub-tropical shrub.

The Annual Chrysanthemum Show was held on the 7th, 8th, 9th and 10th of November, when several growers staged the finest

plants ever shown at any exhibition in the United States. The varieties were:

A. Fewkes.	Louis Boehmer.
Canning.	Mrs. Bishop.
Grandiflora.	President Hyde.
Ivory.	Puritan.
J. H. White.	W. A. Falconer.
Lincoln.	W. B. Smith.

In the next season we expect even better results, the prizes offered being within the reach of the small as well as the large growers.

For the Committee,

DAVID ALLAN,

Chairman.

PRIZES AND GRATUITIES AWARDED FOR PLANTS.

FEBRUARY 4.

LACHENALIAS.— Three six-inch pots, John L. Gardner	$5 00
Gratuities :—	
George M. Anderson, Display of Cyclamens	6 00
Mrs. A. D. Wood, Heaths, etc.	3 00
Nathaniel T. Kidder, *Acacia heterophylla*	2 00
George B. Gill, two pots of Narcissuses	1 00
John L. Gardner, Freesias	1 00

FEBRUARY 25.

Gratuity :—	
Charles E. Richardson, Seedling Amaryllis	2 00

SPRING EXHIBITION.

MARCH 21, 22, 23, AND 24.

Theodore Lyman Fund.

INDIAN AZALEAS.— Six distinct named varieties, in pots, Nathaniel T. Kidder	20 00
Second, Francis Brown Hayes	15 00
ORCHIDS.— Ten plants in bloom, the second prize to E. W. Gilmore	25 00

Society's Prizes.

INDIAN AZALEAS.— Two distinct named varieties, in not exceeding ten-inch pots, Nathaniel T. Kidder	6 00
Second, Francis Brown Hayes	4 00
Specimen plant, named, Dr. C. G. Weld	8 00
Second, Francis Brown Hayes	6 00
Single plant, of any named variety, in not exceeding an eight-inch pot, Dr. C. G. Weld	5 00
ORCHIDS.— Three plants in bloom, Nathaniel T. Kidder	10 00
Second, Nathaniel T. Kidder	8 00
Single plant in bloom, E. W. Gilmore	5 00
Second, Francis Brown Hayes	4 00
STOVE OR GREENHOUSE PLANT.— Specimen in bloom, other than Azalea or Orchid, named, Dr. C. G. Weld, *Acacia pubescens*	8 00
Second, John L. Gardner, *Boronia heterophylla*	6 00

HARDY FLOWERING DECIDUOUS SHRUBS, FORCED.— Four of four distinct species, named, Bussey Institution	8 00
Second, Bussey Institution	6 00
HARDY FLOWERING EVERGREEN SHRUBS, FORCED.— Four of four distinct species, named, Bussey Institution	8 00
CYCLAMENS.— Ten plants in bloom, Dr. C. G. Weld	8 00
Second, George M. Anderson	6 00
Third, Mrs. Mary T. Goddard	4 00
Three plants in bloom, Dr. C. G. Weld	4 00
Second, George M. Anderson	3 00
Third, Mrs. Mary T. Goddard	2 00
Single specimen in bloom, George M. Anderson	3 00
Second, Dr. C. G. Weld	2 00
Third, Mrs. Mary T. Goddard	1 00
HARD-WOODED GREENHOUSE PLANTS.— Four in bloom, Nathaniel T. Kidder	8 00
Second, Dr. C. G. Weld	6 00
HARDY POLYANTHUSES.— Ten plants, Fancy and Gold Laced, William Patterson	5 00
Second, Dr. C. G. Weld	4 00
AURICULAS.— Six, in pots, Dr. C. G. Weld	3 00
CINERARIAS.— Six varieties in bloom, in not over nine-inch pots, John L. Gardner	8 00
Second, Elisha S. Converse	6 00
Third, Dr. C. G. Weld	5 00
Three varieties in bloom, in not over nine-inch pots, Dr. C. G. Weld	5 00
Second, John L. Gardner	4 00
Single plant in bloom, John L. Gardner	3 00
Second, Dr. C. G. Weld	2 00

Special Prize for Florists only.

GENERAL DISPLAY OF SPRING BULBS.— All classes, Bussey Institution	12 00
Second, William S. Ewell & Son	10 00

Regular Prizes.

HYACINTHS.— Twelve distinct named varieties, in pots, one in each pot, in bloom, Dr. C. G. Weld	10 00
Second, John L. Gardner	8 00
Third, George M. Anderson	6 00
Six distinct named varieties, in pots, one in each pot, in bloom, Dr. C. G. Weld	6 00
Second, Nathaniel T. Kidder	5 00
Third, George M. Anderson	4 00
Three distinct named varieties, in pots, one in each pot, in bloom, Nathaniel T. Kidder	4 00

Second, Dr. C. G. Weld	3 00
Third, George M. Anderson	2 00
Single named bulb, in pot, in bloom, Dr. C. G. Weld	2 00
Second, Nathaniel T. Kidder	1 00
Three pans, not to exceed twelve inches, ten bulbs of one variety in each pan, in bloom, Dr. C. G. Weld	10 00
Second, Nathaniel T. Kidder	8 00
Third, John L. Gardner	6 00
Two pans, ten bulbs of one variety in each pan, in bloom, Dr. C. G. Weld	8 00
Second, Nathaniel T. Kidder	6 00
Third, John L. Gardner	5 00
Single pan, with ten bulbs of one variety in bloom, Nathaniel T. Kidder	5 00
Second, Dr. C. G. Weld	4 00
Third, John L. Gardner	3 00
TULIPS.— Six eight-inch pans, nine bulbs in each, in bloom, Nathaniel T. Kidder	5 00
Second, William S. Ewell & Son	4 00
Third, Bussey Institution	3 00
Three eight-inch pans, nine bulbs in each, in bloom, Dr. C. G. Weld	4 00
Second, William S. Ewell & Son	3 00
Third, Bussey Institution	2 00
Three ten-inch pans, twelve bulbs of one variety in each pan, William S. Ewell & Son	6 00
Second, Dr. C. G. Weld	5 00
Third, Bussey Institution	4 00
Fourth, Nathaniel T. Kidder	3 00
POLYANTHUS NARCISSUS.— Four seven-inch pots, three bulbs in each, distinct varieties, in bloom, Dr. C. G. Weld	6 00
Second, Bussey Institution	4 00
Third, John L. Gardner	3 00
JONQUILS.— Six six-inch pots, number of bulbs at the discretion of the grower, in bloom, Bussey Institution	3 00
Second, John L. Gardner	2 00
LILIUM HARRISII.— Three pots, not exceeding ten inches, George M. Anderson	8 00
Second, Bussey Institution	6 00
LILY OF THE VALLEY.— Six six-inch pots, in bloom, Bussey Institution	5 00
Second, William S. Ewell & Son	4 00
ANEMONES.— Three pots or pans, Bussey Institution	5 00
FREESIAS.— Six pots or pans, John L. Gardner	5 00
Third, Bussey Institution	3 00
IXIAS.— Six pots, in varieties, Dr. C. G. Weld	4 00
ROMAN HYACINTHS.— Six eight-inch pans, ten bulbs in each pan, Bussey Institution	5 00

Second, Dr. C. G. Weld	4 00
Third, John L. Gardner	3 00

Gratuities :—

Siebrecht & Wadley, New Rochelle, N. Y., Orchids, and other rare plants	5 00
Bussey Institution, *Andromeda speciosa*	5 00
L. H. Parker, *Cypripedium acaule*	1 00
Joseph Tailby, Rose W. A. Richardson	3 00
Martin H. Cummings, Carnation Gov. Russell	3 00
Rea Brothers, Seedling *Primula Sieboldi*	10 00
Mrs. Mary T. Goddard, Display of Plants	10 00
Francis Brown Hayes, " " "	10 00
William Patterson, " " "	8 00
Nathaniel T. Kidder, Collection of Plants	5 00
Dr. C. G. Weld, " " "	5 00
Pitcher & Manda, Short Hills, N. J., New Plants	5 00
John L. Gardner, Collection of Plants	3 00

April 1.

Gratuity :—

Francis Brown Hayes, Azalea Mlle. Marie Van Houtte	1 00

April 8.

Gratuities :—

Jackson Dawson, Forced *Spiræa aruncus*	4 00
Whittet & Co., Seedling Cactus	1 00

MAY EXHIBITION.

May 6.

Pelargoniums.— Six named Show or Fancy varieties, in pots, in bloom, Nathaniel T. Kidder	8 00
Second, John L. Gardner	6 00
Indian Azaleas.— Single specimen, in pot, named, Nathaniel T. Kidder	5 00
Calceolarias.— Six varieties, in pots, John L. Gardner	8 00
Second, Joseph H. White	6 00
Single plant, John L. Gardner	3 00
Second, Joseph H. White	2 00

Gratuities :—

Norton Brothers, Two plants of *Dendrobium thyrsiflorum*	3 00
Francis Brown Hayes, Collection of Hydrangeas	5 00
Nathaniel T. Kidder, " " Streptocarpus	4 00
Bussey Institution, " " Ixias	4 00

MAY 13.

Gratuities :—

Robert Petremant, Forty-six pots of Auriculas	3 00
Lewis H. Farlow, *Cattleya Mendelii*, in bloom	1 00
Mrs. S. H. Coleman, Seedling Gloxinia	1 00

ROSE EXHIBITION.

JUNE 22 AND 23.

STOVE AND GREENHOUSE FLOWERING PLANTS.— Two distinct named varieties, in bloom, no Orchid admissible, Nathaniel T. Kidder	15 00
Second, Dr. C. G. Weld	10 00
SPECIMEN PLANT IN BLOOM.— Named, other than Orchid, Dr. C. G. Weld	7 00
Second, John L. Gardner	5 00
SPECIMEN FOLIAGE PLANT.— New and rare, other than Orchid, Dr. C. G. Weld	7 00
Second, Nathaniel T. Kidder	5 00
HARD WOODED GREENHOUSE PLANTS.— Three, of three distinct named varieties, in bloom, John L. Gardner	8 00
GLOXINIAS.— Six pots, not less than eight-inch, Dr. C. G. Weld	8 00
Second, Charles Francis Adams	6 00
ORCHIDS.— Six plants, of six named varieties, in bloom, E. W. Gilmore	25 00
Second, John L. Gardner	15 00
Three plants, of three named varieties, in bloom, Dr. C. G. Weld	15 00
Second, John L. Gardner	10 00
Single specimen plant, named, E. W. Gilmore	8 00
Second, John L. Gardner	6 00
TUBEROUS BEGONIAS.— Six pots, of six varieties, Elisha S. Converse	6 00

Gratuities :—

E. W. Gilmore, Orchids	3 00
John L. Gardner, Orchids and Ericas	3 00
Anthony McLaren, *Phormium tenax variegata*	1 00

JULY 22.

Gratuities :—

John L. Gardner, *Platyclinis filiformis*	5 00
Mrs. A. D. Wood, *Lilium Wallichianum*	2 00
Miss Philena Baker, Cactus bearing thirty flowers	1 00

JULY 29.

HYDRANGEAS.— Pair, Hon. Joseph S. Fay	8 00

AUGUST 12.

Gratuity :—

George M. Anderson, *Heliconia aurea striata* 2 00

AUGUST 26.

Gratuities :—

Charles Storer, *Cattleya Gaskelliana* 1 00
James Comley, *Begonia Rex* var. Duchesse de Brabant . . . 1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 6 AND 7.

Special Prizes, offered by the Society.

PALMS.— Pair, in pots or tubs not more than twenty-four inches in diameter, George A. Nickerson 12 00
Second, Joseph H. White 8 00
Pair, in pots not more than fourteen inches in diameter, Dr. C. G. Weld 8 00

Regular Prizes.

GREENHOUSE PLANTS.— Six greenhouse and stove plants, of different named varieties, two Crotons admissible, George A. Nickerson 30 00
Second, Nathaniel T. Kidder 25 00
Third, Dr. C. G. Weld 20 00
Single plant for table decoration, dressed at the base with living plants only, only one entry admissible, George A. Nickerson 8 00
Second, Elisha S. Converse 6 00
Third, Joseph H. White 4 00
SPECIMEN FLOWERING PLANT.— Single named variety, Joseph H. White 8 00
Second, Joseph H. White 6 00
FUCHSIAS.— Six, in not over ten-inch pots, Joseph H. White . . 6 00
ORNAMENTAL LEAVED PLANTS.— Six named varieties not offered in the collection of greenhouse plants, Crotons and Dracænas not admissible, Nathaniel T. Kidder 20 00
Second, Joseph H. White 15 00
Third, George A. Nickerson 12 00
Single specimen, variegated, named, not offered in any collection, George A. Nickerson 6 00
Second, Nathaniel T. Kidder 5 00
Third, Joseph H. White 4 00
CALADIUMS.— Six named varieties, Nathaniel T. Kidder . . . 6 00
Second, Dr. C. G. Weld 4 00
FERNS.— Six named varieties, no Adiantums admissible, Nathaniel T. Kidder 10 00

Second, George A. Nickerson	8 00
ADIANTUMS.— Five distinct named species, George A. Nickerson	8 00
Second, Nathaniel T. Kidder	5 00
TREE FERN.— Single specimen, named, not less than six feet in height, George A. Nickerson	10 00
LYCOPODS.— Four named varieties, Nathaniel T. Kidder	5 00
Second, George A. Nickerson	4 00
DRACÆNAS.— Six named varieties, Nathaniel T. Kidder	8 00
Second, Dr. C. G. Weld	6 00
CROTONS.— Six named varieties, in not less than twelve-inch pots, George A. Nickerson	10 00
Six in six-inch pots, Dr. C. G. Weld	6 00
CYCAD.— Single plant, named, Mrs. A. D. Wood	10 00
Second, Joseph H. White	8 00
Third, Nathaniel T. Kidder	6 00
ORCHIDS.— Single plant in bloom, the second prize to David Allan	4 00

Gratuities :—

Dr. C. G. Weld, Display of Plants	15 00
Pitcher & Manda, Short Hills, N. J., Display of Plants	10 00
Francis Brown Hayes, " " "	5 00
Mrs. A. D. Wood, Collection of varieties of *Begonia Rex*	10 00
Mrs. George L. Brown, *Vallota purpurea*	5 00
Joseph H. White, Caladiums	3 00
Joseph Clark, *Campanula pyramidalis alba*	3 00
R. McLellan, *Lomaria gibba var.*	3 00

OCTOBER 7.

Gratuity :—

Hon. Joseph R. Leeson, *Cattleya Bowringiana*	2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

CHRYSANTHEMUMS.— Display of twelve named plants, any or all classes, distinct varieties, Walter Hunnewell	60 00
Second, Nathaniel T. Kidder	50 00
Third, Arthur Hunnewell	40 00
Fourth, Dr. C. G. Weld	30 00
Group of Plants, arranged for effect, limited to one hundred and fifty square feet, William H. Elliott	45 00
Second, Bussey Institution	40 00
Third, Francis Brown Hayes	35 00
Six Japanese, distinct named varieties, Dr. C. G. Weld	20 00
Second, Walter Hunnewell	15 00
Third, Nathaniel T. Kidder	10 00

Specimen Incurved or Chinese, named variety, Dr. C. G. Weld	6 00
Second, Arthur Hunnewell	5 00
Third, Nathaniel T. Kidder	4 00
Specimen Japanese, named variety, Walter Hunnewell	6 00
Second, Arthur Hunnewell	5 00
Third, Nathaniel T. Kidder	4 00
Specimen Pompon, named variety, Arthur Hunnewell	5 00
Second, Arthur Hunnewell	4 00
Third, Dr. Henry P. Walcott	3 00

Gratuities :—

William H. Elliott, Display of Chrysanthemums	25 00
David Allan, " " Orchids	3 00
Joseph Tailby, Callas,	2 00

NOVEMBER 18.

Gratuity :—

Francis Brown Hayes, Display of New Chrysanthemums	15 00

DECEMBER 30.

Gratuity :—

John L. Gardner, Orchids, Heaths, and Poinsettias	10 00

SOCIETY'S GOLD MEDAL.

July 29. Hon. Joseph S. Fay (M. H. Walsh, Gardener), Superior Cultivation of Hydrangeas.

SOCIETY'S SILVER MEDALS.

March 4. Jackson Dawson, Hybrid Seedling Rose, Arnold; a cross between *Rosar ugosa* and Gen. Jacqueminot, serviceable as a hardy decorative shrub.

Spring Exhibition, March 21–24. Francis Brown Hayes, *Cycas revoluta.*

June 13. F. Sander & Co., St. Albans, Herts, England, *Dracæna Sanderiana.*

Annual Exhibition, September 6 and 7. George McWilliam, Display of *Caladium argyrites.*

" " " " Nathaniel T. Kidder, *Davallia Fijiensis.*

" " " " Joseph H. White, *Nephrolepis exaltata.*

" " " " Pitcher & Manda, Short Hills, N. J., *Araucaria excelsa compacta.*

SOCIETY'S BRONZE MEDALS.

Annual Exhibition, September 6 and 7. Pitcher & Manda, *Geonoma acaulis.*

September 23. Hon. Joseph R. Leeson, *Saccolabium guttatum.*

FIRST-CLASS CERTIFICATES OF MERIT.

Spring Exhibition, March 21–24. Pitcher & Manda, Short Hills, N. J., *Cypripedium Grayanum unicolor.*

Rose Show, June 23. William W. Lunt, *Cattleya gigas.*

" " " Jackson Dawson, New Hybrid Seedling Rose, a cross between *Rosa Wichuriana* and Gen. Jacqueminot.

July 15. Hon. Joseph R. Leeson, *Cattleya Leopoldii.*

Annual Exhibition, September 6 and 7. Pitcher & Manda, Short Hills, N. J., *Cypripedium Allanianum.*

" " " " Pitcher & Manda, *Cypripedium luridum.*

" " " " Pitcher & Manda, Display of Rare Plants.

" " " " Dr. C. G. Weld, *Pteris tremula Smithiana.*

" " " " Nathaniel T. Kidder, *Allamanda Williamsii.*

Chrysanthemum Show, November 7–10. Rea Brothers, *Aster grandiflorus.*

REPORT

OF THE

COMMITTEE ON FLOWERS,

FOR THE YEAR 1893.

By ARTHUR H. FEWKES, Chairman.

The report of the Committee on Flowers, for the year 1893, is a short one, as there has been but little out of the ordinary course in the way of exhibitions. In general there has been not less than the usual interest manifested either by the exhibitors or by those who visit our exhibitions and we have had excellent displays of all the favorite and time-honored flowers.

The displays of Herbaceous Plants, while not lacking in interest, have not been so numerous as last year and the competition has been less spirited.

We have noted an increase in the number of mixed displays, which we deplore, for, while they serve to embellish the tables, they are not educational, and it has been our endeavor to make the highest awards where the idea of the exhibitor has been to give as much information to the public as possible.

With the great increase in the production of new varieties of florists' flowers, especially in Carnations and Chrysanthemums, the want is felt for some form of award which will recognize what good qualities are apparent in a new variety, but will give such instructions to the originator as will prevent him from making use of this award for advertising purposes and giving to the trade a variety which does not bear our full approval. We have adopted a form of award which we call a Complimentary Notice and which is in the nature of a letter of advice to the originator.

The interest in Aquatics has been so marked that we anticipate some very interesting displays on the earlier date on which additional prizes will be offered next season.

During the early part of the season the tables were brightened by many choice displays; those of forced Wistaria by Francis Brown Hayes were particularly beautiful and were made for four consecutive Saturdays, beginning February 11. On the same date Honorable Mention was awarded to Arthur H. Fewkes, for a seedling Scarlet Geranium of great promise.

On March 4, J. McGregor showed a seedling Crimson Carnation, Jacqueminot, which was remarkable for its clear color, large size, and fine stem. A First Class Certificate of Merit was awarded to him for this variety.

SPRING EXHIBITION.

March 21, 22, 23, and 24.

The cut flower department of this otherwise excellent exhibition was not equal to former years, although there were some very fine displays. The competition in the classes for Roses was very meagre, there being none in the Hybrid Perpetuals and only two competitors in the Teas.

The Carnations were quite well represented. The best Crimson shown in competition was F. Mangold; the best Pink, The Princess; the best Scarlet, Hector; the best White, Mrs. Fisher; and the best Yellow, Buttercup.

Violets and Pansies were very well shown.

Joseph Tailby & Son were awarded a First Class Certificate of Merit for their seedling self yellow Carnation, Henriette Sargent; and George B. Gill and Arthur H. Fewkes were awarded Honorable Mention for seedling Carnations; Siebrecht & Wadley, of New Rochelle, N. Y., for a new Hybrid Tea Rose, and John N. May, of Summit, N. J., for Hybrid Tea Rose, Mrs. W. C. Whitney.

MAY EXHIBITION.

May 6.

Cut flowers at this show were not numerous but there were some very fine collections of Pansies and Narcissuses shown. The native plants attracted much attention, as these early wild flowers are always sure to do. Two new Carnations, of a deep pink color, were shown by William Nicholson. The one named Nicholson

was of great size as well as good color; the other, Ada Byron, was similar in color and remarkably fragrant. Honorable Mention was awarded them.

From the May Show until the Rhododendron Show, the exhibits increased in excellence each week, as the late spring flowers began to come in.

RHODODENDRON SHOW.

June 13 and 14.

This show was postponed one week from the regular date, June 6 and 7, on account of the lateness of the season. It was undoubtedly the most successful show of this kind we have ever held. The displays of Rhododendrons were wonderful, the principal exhibitors being Francis Brown Hayes, H. H. Hunnewell, John L. Gardner, Joseph Clark, Samuel J. Trepess, and Edwin Sheppard & Son.

The collection from Francis Brown Hayes was especially remarkable, filling the greater part of the tables in the lower hall as well as the entire stage. He was awarded a Gold Medal for this display.

The Pæonies shown were the best we have had for many years.

The display of Flowering Trees and Shrubs from Hon. Joseph S. Fay, was a very attractive exhibit and filled the entire stage in the upper hall. The Hawthorns and Laburnums were very noticeable among them. A Silver Medal was awarded him for this display.

It was a little late for the Hardy Azaleas and consequently the displays of these were not as good as usual, but in all other seasonable garden flowers — German Irises, Hardy Pyrethrums, Papavers, and all other kinds of Hardy Herbaceous Plants — the displays were numerous and of great excellence.

J. W. Manning was awarded a First Class Certificate of Merit for a very large and finely colored variety of *Papaver orientale*.

ROSE SHOW.

June 22 and 23.

This show was also postponed from the 20th, making it two days later. It was fully equal to any we have had in late years, and the prizes were quite generally competed for.

As has been the case for several years previous, the finest roses came from the southern part of the State — Wood's Holl and New Bedford.

In the class for a single bloom of a variety introduced since 1890, Hon. Joseph S. Fay took all three prizes with the varieties Margaret Dickson, Mrs. Paul, and Duke of Fife, in the order named.

Margaret Dickson is in the way of Merveille de Lyon, but with more color and very fine foliage.

Mrs. Paul is a very large flower with reflexed petals, light rose in color, with darker shadings.

Duke of Fife is a large, broad petalled flower with full centre, bright crimson in color and fragrant. The foliage is large and bold.

The miscellaneous displays were quite numerous and many excellent things were shown.

Thomas C. Thurlow made a magnificent display of Herbaceous Pæonies, for which the Appleton Silver Medal was awarded him.

Jackson Dawson showed an interesting lot of seedling Hybrid Roses, two of which were awarded First Class Certificates of Merit. No. 2, a cross between Multiflora and Miss Hassard, has the foliage of the latter but with the habit of the former, only with much larger flowers and beautifully crimped petals; the color is pure white. No. 3 is a cross between Multiflora and Gen. Jacqueminot, with the same sized flower as Multiflora but double and slightly tinged with pink.

Hicks Arnold was awarded a First Class Certificate of Merit for *Lœlia Arnoldianum.*

The weekly exhibitions from July 1 to the Annual Exhibition, sustained their usual excellence but there was little of which to make special mention. The displays of roses the week after the regular Rose Show were fully equal to those then shown, and Mr. M. H. Walsh exhibited his new seedling Hybrid Perpetual Rose, named by his employer, Hon. Joseph S. Fay, the Michael H. Walsh. This is a magnificent, fragrant rose, in the way of Baron de Bonstetten but of a much richer crimson, very large, with strong wood and bold foliage. A First Class Certificate of Merit was awarded this rose.

July 29, Fisher Brothers & Co. were awarded a First Class Certificate of Merit for their new pure white Sweet Pea, Snowflake.

August 12, Thomas H. Flynn was awarded a First Class Certificate of Merit for the new Canna, Florence Vaughn.

August 26 was Aster day, and the Large Flowered varieties were well represented, the prizes being all strongly competed for.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

September 6 and 7.

The public is seldom treated to a more beautiful display of flowers than was put before them at this exhibition. Asters, Dahlias, and Zinnias have seldom been better shown. Among the cut flowers the Aquatics were the centre of attraction. Two fine displays of these were made, by John Simpkins, and William Tricker of Dongan Hills, Staten Island, N. Y., the latter was awarded Honorable Mention for the new *Nymphœa tuberosa hybrida.*

The native plants attracted much attention and seemed to be thoroughly appreciated by a large number of visitors.

Owing to cold and windy weather just previous to the exhibition, the displays of Flowering Cannas were far from satisfactory, which was quite unfortunate, for their brilliant flowers are a welcome addition to the exhibition.

September 23 was prize day for Native Asters, and larger and better displays were made than ever before, forming a very attractive exhibition.

September 30 Jackson Dawson exhibited his new, fall flowering Astilbe, *A. Chinensis* var. *Japonica*, which is remarkable for its late season of blooming. A First Class Certificate of Merit was awarded him for it.

October 4, J. Warren Clark made a fine display of seedling Gladioli, including many distinct and choice varieties. A Silver Medal was awarded him for the collection.

October 14, a new seedling Canna was shown by A. H. Fewkes, with large spotted yellow flowers, for which a First Class Certificate of Merit was awarded.

October 28, J. F. Clark exhibited a seedling Chrysanthemum, No. 1, '93, somewhat in the way of the variety Banquet, but fuller and deeper yellow in color; a very fine early yellow. A First Class Certificate of Merit was awarded this for good quality combined with earliness.

CHRYSANTHEMUM SHOW.

November 7, 8, 9, and 10.

This was one of the most successful Chrysanthemum Shows we have ever held—not so much in point of numbers as in the general perfection of the flowers shown. It seems as though the limit of size, combined with fine texture, has been reached, for it would appear next to impossible to develop Chrysanthemum flowers to greater size than some of the specimens shown by John Simpkins, and the scarcely inferior ones shown by several other exhibitors.

The prizes in the principal classes were all well competed for, and there were many exhibits not in competition. The special prizes offered by Miss Simpkins and Edward Hatch did not bring out as much competition as could be wished, probably owing to the late date at which the prizes were offered. The greatest competition was shown in the class for twenty-five blooms of twenty-five varieties, and in the classes for seedlings. There were nearly forty entries in the latter classes and many beautiful varieties were presented. One shown by Pitcher & Manda of Short Hills, N. J., and named Pitcher & Manda, was a most distinct departure, it being a very large, full, double, somewhat flat flower; white, with the centre florets clear yellow, producing a very striking effect.

First Class Certificates of Merit were awarded to Pitcher & Manda for Chrysanthemums Pitcher & Manda and Dorothy Toler; to Mann Brothers for Chrysanthemum Mutual Friend; Theophilus D. Hatfield for Chrysanthemum A. H. Fewkes; Sewall Fisher for Carnation Nicholson; Edwin Lonsdale, Philadelphia, Pa., for Carnation Helen Keller, and William Edgar for a vase of Mignonette Edgar's Improved.

Complimentary Notices were issued to James Wheeler for Chrysanthemum Mrs. Joseph H. White; James Brydon for Chrysanthemum Portia; T. D. Hatfield for Chrysanthemum J. Pethers, and to Sewall Fisher for Carnation Ada Byron.

A Silver Medal was awarded to A. H. Fewkes for Seedling Canna No. 2, '93.

The Shady Hill Nursery Co., having obtained the greatest number of first prizes throughout the season for Herbaceous Plants, became entitled to the Appleton Silver Medal. As no other competitor has exhibited more than once the Bronze Medal is withheld.

We lament the loss by death of one of our number, Mr. E. H. Hitchings, who had served with us so long and faithfully. We not only miss his presence among us, but we miss the choice collections of rare wild flowers he so delighted to collect and exhibit.

The Committee have awarded during the year one Gold Medal, three Society's Silver Medals, two Appleton Silver Medals, nineteen First Class Certificates of Merit, Nine Honorable Mentions, and five Complimentary Notices.

The amount appropriated for the year 1893, was	$2,400 00
We have awarded in prizes and gratuities, including medals	$2,340 00
Leaving an unexpended balance of	$60 00

We have also awarded in Special Prizes the amount of $80.00.

All of which is respectfully submitted,

For the Committee,

ARTHUR H. FEWKES,
Chairman.

PRIZES AND GRATUITIES AWARDED FOR FLOWERS.

January 7.

Gratuities: —

Francis Brown Hayes, Basket of Camellias	$2 00
Mrs. A. D. Wood, Cut Flowers	1 00
Mrs. E. M. Gill, " "	1 00
George McWilliam, Lælias	1 00

January 14.

Gratuities: —

George B. Gill, Carnations	1 00
" " " Cut Flowers	1 00

February 4.

Orchids.— Display of species and varieties, filling not less than twenty bottles, E. W. Gilmore	15 00
Second, John L. Gardner	10 00
Carnations.— Display of cut blooms, with foliage, not less than six varieties, in vases, Richard T. Lombard	5 00
Camellias.— Display of named varieties, cut flowers with foliage, not less than six varieties, in vases, Francis Brown Hayes	4 00
Second, John L. Gardner	3 00

Gratuities: —

George B. Gill, Carnations	1 00
Charles E. Richardson, *Acacia longifolia*	1 00
Rose Buxton, *Lilium Harrisii*	1 00
H. K. Southworth, Vase of Pinks	1 00
Mrs. A. D. Wood, Cut Flowers	2 00
Mrs. E. M. Gill, Basket of Flowers	1 00

February 11.

Gratuities: —

Francis Brown Hayes, Camellias and Cut Flowers	3 00
" " " Forced Wistaria	2 00
Mrs. A. D. Wood, Cut Flowers	1 00

February 18.

Gratuities: —

Francis Brown Hayes, Pyramid of Wistaria and vase of Camellias	8 00
George S. Harwood, Five varieties of Violets	1 00

February 25.

Gratuities: —

Francis Brown Hayes, Display of Roses and Wistaria	$5 00
H. H. Hunnewell, *Clematis indivisa*	2 00
H. L. Southworth, Vase of Carnations J. J. Harrison and Nellie Lewis	1 00
James McGreggor, Seedling Crimson Carnation	1 00
Mrs. E. M. Gill, Cut Flowers	2 00

March 4.

Gratuities: —

Francis Brown Hayes, Roses, Wistaria, etc.	6 00
J. C. Rogers, Roses, Carnations, etc.	3 00
George B. Gill, Seedling Carnations	1 00
Joseph H. White, Callas	1 00
Mrs. A. D. Wood, Cut Flowers	3 00
Mrs. E. M. Gill " "	1 00

March 11.

Gratuities: —

Francis Brown Hayes, Roses, etc.	4 00
Mrs. E. M. Gill, Cut Flowers	1 00

SPRING EXHIBITION.

March 21, 22, 23, and 24.

Tender Roses in Vases.— Twelve blooms of Catherine Mermet, J. Newman & Son	$8 00
Second, Peck & Sutherland	6 00
Twelve blooms of The Bride, J. Newman & Son	8 00
Second, Peck & Sutherland	6 00
Pansies. — Forty-eight cut blooms, not less than twenty-four varieties, Hon. Joseph S. Fay	4 00
Second, H. K. Southworth	3 00
Third, William Patterson	2 00
Violets.— Best collection of varieties, fifty blooms of each in a bunch, Nathaniel T. Kidder	4 00
Second, Harry S. Rand	3 00
Third, William Patterson	2 00
Carnations.— Twelve blooms of any named crimson variety, E. G. Bridge, for F. Mangold	3 00
Twelve blooms of any named pink variety, Galvin Brothers, for The Princess	3 00
Twelve blooms of any named scarlet variety, E. G. Bridge, for Hector	3 00
Twelve blooms of any named white variety, E. G. Bridge, for Mrs. Fisher	3 00

Twelve blooms of any named yellow variety, H. K. Southworth, for Buttercup	$3 00
Centre Piece.— Mrs. A. D. Wood	8 00
Second, Norton Brothers	6 00
Gratuities: —	
Bussey Institution, Cherokee Roses	2 00
Hon. Joseph S. Fay, three dishes of Pansies	2 00
Richard T. Lombard, Vase of Carnations	3 00
Peter Fisher & Co., New Carnation, Jacqueminot,	2 00
Siebrecht & Wadley, New Rochelle, N. Y., Cut Orchids	2 00
E. Sheppard & Son, Orchids and Azaleas	3 00
Harry S. Rand, Vase of Sweet Peas	1 00
Nathaniel T. Kidder, *Iris Susiana*	1 00
Francis Brown Hayes, Cut Flowers	7 00
Mrs. A. D. Wood, " "	5 00
Mrs. E. M. Gill, " "	1 00

April 15.

Gratuity: —	
Francis Brown Hayes, *Mackaya bella*	1 00

April 29.

Gratuities: —	
Mrs. E. M. Gill, Cut Flowers	2 00
Mrs. P. D. Richards, Wild Flowers	1 00

MAY EXHIBITION.

May 6.

Hardy Narcissuses.— Collection of not less than ten named varieties of blooms, John L. Gardner	6 00
Pansies.— Forty-eight cut blooms, not less than twenty-four varieties, Hon. Joseph S. Fay	5 00
Second, Denys Zirngiebel	4 00
Third, " "	3 00
Basket of Flowers.— Mrs. A. D. Wood	6 00
Native Plants.— Collection, not exceeding thirty bottles, Mrs. P. D. Richards	5 00
Gratuities: —	
Hon. Joseph S. Fay, Display of Pansies	5 00
Francis Brown Hayes, Cut Flowers	3 00
John L. Gardner, Hyacinths	1 00
Mrs. E. M. Gill, Cut Flowers	1 00

May 13.

Gratuities: —	
Bussey Institution, Collection of Hardy Narcissuses	3 00
Francis Brown Hayes, Cut Shrubs	2 00

Mrs. E. M. Gill, Cut Flowers	$2 00
Mrs. P. D. Richards, Native Plants	1 00

MAY 20.

Gratuities : —

Nathaniel T. Kidder, Tulips and Streptocarpus	5 00
Dr. C. G. Weld, Tulips and Narcissuses	4 00
Francis Brown Hayes, Cut Flowering Shrubs	4 00
J. Willard Hill, Pansies	1 00
Mrs. A. D. Wood, Cut Flowers	4 00
Mrs. E. M. Gill, " "	2 00
Mrs. P. D. Richards, Wild Flowers,	3 00

MAY 27.

Gratuities : —

Francis Brown Hayes, Cut Flowering Shrubs	4 00
Bussey Institution, Collection of Darwin Tulips	2 00
" " Collection of Species of Tulips	1 00
Mrs. P. D. Richards, Wild Flowers	2 00

JUNE 3.

Gratuities : —

H. H. Hunnewell, Rhododendrons	4 00
Francis Brown Hayes, Cut flowering Trees and Shrubs	4 00
" " " Collection of Pyrethrums	2 00
Shady Hill Nursery Co., Tree Pæonies	2 00
Benjamin D. Hill, Tree Pæonies and Lilacs	1 00
Walter H. Cowing, Collection of Aquilegias	1 00
Mrs. A. D. Wood, Cut Flowers	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. P. D. Richards, Wild Flowers	2 00

JUNE 10.

Gratuities : —

Francis Brown Hayes, Display of Rhododendrons	10 00
J. W. Manning, Collection of Herbaceous Plants	2 00
William C. Strong, Collection of Pyrethrums	1 00
Mrs. Mary T. Goddard, Display of Clematis	1 00
Benjamin D. Hill, Clematis and Pæonies	1 00

RHODODENDRON SHOW.

JUNE 13 AND 14.

H. H. Hunnewell Premiums.

RHODODENDRONS. — Twelve distinct Hardy varieties, named, Samuel J. Trepess, a piece of plate valued at	20 00
Second, John L. Gardner, a piece of plate valued at	15 00
Six distinct Hardy varieties, named, Samuel J. Trepess	10 00

Second, Joseph Clark	$5 00
Single truss of any Tender variety, named, Joseph Clark	2 00
Second, John L. Gardner	1 00
HARDY AZALEAS.— From any or all classes, fifteen varieties, one vase of each, Thomas C. Thurlow	8 00
Cluster of trusses, one variety, Thomas C. Thurlow	2 00

Society's Prizes.

HERBACEOUS PÆONIES.—Twelve named varieties, Arthur H. Fewkes	10 00
Second, John L. Gardner	8 00
GERMAN IRISES.— Six distinct varieties, one spike of each, Mrs. E. M. Gill	3 00
Second, Mrs. A. D. Wood	2 00
HARDY PYRETHRUMS.— Display, Dr. C. G. Weld	3 00
Second, Shady Hill Nursery Co.	2 00
HARDY FLOWERING TREES AND SHRUBS.— Collection of thirty species and varieties, named, cut blooms, Nathaniel T. Kidder	8 00
HERBACEOUS PLANTS.— Thirty bottles, J. W. Manning	8 00
Second, Shady Hill Nursery Co.	6 00
BASKET OF FLOWERS.— Mrs. A. D. Wood	5 00
Second, Mrs. E. M. Gill	4 00
NATIVE PLANTS.— Collection, not exceeding thirty bottles, of named species and varieties, Mrs. P. D. Richards	5 00

Gratuities : —

H. H. Hunnewell, Display of Rhododendrons and Azaleas	20 00
John L. Gardner, Collection of Rhododendrons, etc.	6 00
F. W. Vanderbilt, Newport, R. I., Collection of Rhododendrons	3 00
O. B. Hadwen, Collection of Rhododendrons	1 00
E. Sheppard & Son, Hardy Azaleas and Rhododendrons	2 00
Joseph Clark, Rhododendrons and *Clematis montana*	2 00
Thomas C. Thurlow, Collection of Hardy Azaleas	2 00
" " " Collection of Pæonies	5 00
Leverett M. Chase, Pæonies	1 00
Mrs. E. M. Gill, Irises, Pæonies, etc.	3 00
Mrs. Mary T. Goddard, Clematis	3 00
Benjamin D. Hill, Clematis, etc.	1 00
Mrs. E. M. Gill, Hardy Pyrethrums	1 00
Nathaniel T. Kidder, Collection of Herbaceous Plants	4 00
Rea Brothers, Herbaceous Plants	1 00
Walter H. Cowing, Collection of Aquilegias	3 00
William H. Spooner, Hybrid Roses	3 00
Mrs. A. A. Johnson, Laurel	3 00
E. Sheppard & Son Pelargoniums	2 00
Fisher Brothers & Co., Vase of Canna Mme. Crozy	1 00
Elisha S. Converse, Tuberous Begonias	1 00
Mrs. A. D. Wood, Cut Flowers	3 00

ROSE EXHIBITION.

June 22 and 23.

Special Prize, Theodore Lyman Fund.

Hardy Perpetual Roses.— Twenty-four distinct named varieties, three of each variety, Hon. Joseph S. Fay	$35 00
Second, Dr. C. G. Weld	30 00
Third, John L. Gardner	25 00

Special Prizes Offered by the Society.

Six blooms of John Hopper, Nathaniel T. Kidder	5 00
Six blooms of Marquise de Castellane, Nathaniel T. Kidder	5 00
Second, Dr. C. G. Weld	4 00
Six blooms of Mme. Gabriel Luizet, Nathaniel T. Kidder	5 00
Second, Dr. C. G. Weld	4 00
Twelve blooms of any other variety, Hon. Joseph S. Fay, Gen. Jacqueminot	7 00
Second, Nathaniel T. Kidder, Magna Charta	5 00

Regular Prizes.

Sixteen distinct named varieties, three of each variety, Hon. Joseph S. Fay	20 00
Twelve distinct named varieties, three of each variety, Hon. Joseph S. Fay	15 00
Second, William Patterson	10 00
Six distinct named varieties, three of each variety, J. Eaton Jr.	15 00
Second, Joseph H. White	10 00
Third, Hon. Joseph S. Fay	8 00
Three distinct named varieties, three of each, Hon. Joseph S. Fay	10 00
Second, Hon. Joseph S. Fay	8 00
Third, " " " "	5 00
Twenty-four distinct named varieties, one of each, Hon. Joseph S. Fay	15 00
Second, John L. Gardner	10 00
Third, William H. Spooner	8 00
Eighteen distinct named varieties, one of each, Hon. Joseph S. Fay	12 00
Second, John L. Gardner	8 00
Third, William H. Spooner	6 00
Twelve distinct named varieties, one of each, Francis Brown Hayes	10 00
Second, Nathaniel T. Kidder	6 00
Third, J. Eaton Jr.	4 00
Six distinct named varieties, one of each, Hon. Joseph S. Fay	6 00
Second, John L. Gardner	4 00
Third, Francis Brown Hayes	3 00
Three distinct named varieties, one of each, Dr. C. G. Weld	3 00

Second, John L. Gardner	$2 00
Third, Hon. Joseph S. Fay	1 00
Best single bloom of a variety introduced since 1890, Hon. Joseph S. Fay, for Margaret Dickson	5 00
Second, Hon. Joseph S. Fay, for Mrs. Paul	4 00
Third, Hon. Joseph S. Fay, for Duke of Fife	3 00
Moss Roses.— Six distinct named varieties, three clusters of each, the third prize to John L. Gardner	3 00
General Display.— One hundred bottles of Hardy Roses, Francis Brown Hayes	10 00
Second, Mrs. E. M. Gill	9 00
Third, John L. Gardner	8 00
Fourth, Benjamin G. Smith	7 00
Fifth, George B. Gill	6 00
Tuberous Begonias.— Twelve spikes, of not less than four varieties, Elisha S. Converse	5 00
Second, E. W. Gilmore	4 00
Sweet Williams.— Thirty spikes, not less than six distinct varieties E. Sheppard & Son	4 00
Second, Walter H. Cowing	3 00
Third, Shady Hill Nursery Co.	2 00
Vase of Flowers.— Best arranged, in one of the Society's glass vases, Mrs. E. M. Gill	5 00
Second, Mrs. A. D. Wood	4 00

Gratuities :—

Hon. Joseph S. Fay, Roses	20 00
Francis Brown Hayes, Roses	12 00
William H. Spooner, Display of Roses	5 00
Dr. C. G. Weld, Roses	5 00
E. Sheppard & Son, Hardy Roses, etc.	3 00
Benjamin G. Smith, Hybrid Roses	1 00
George H. Lomax, " "	1 00
William C. Winter, Display of Roses	1 00
Hon. Joseph S. Fay, Moss Roses	3 00
John L. Gardner " "	2 00
Jackson Dawson, Display of seedling Hybrid Roses	2 00
Walter H. Cowing, Spanish Irises and Sweet Williams	1 00
O. B. Hadwen, Collection of Pæonies	3 00
Mrs. E. M. Gill, Pæonies	3 00
Benjamin D. Hill, Pæonies, etc.	3 00
Nathaniel T. Kidder, *Hydrangea scandens*	1 00
" " " *Syringa Pekinensis*	1 00
Isaac E. Coburn, Collection of Pelargoniums	1 00
Francis Brown Hayes, Foliage and Flowers	10 00
Botanic Garden of Harvard University, Display of Herbaceous Plants	8 00

R. & J. Farquhar & Co., Cut Flowers	$5 00
Mrs. Mary T. Goddard, " "	3 00
Rea Brothers, " "	1 00
Mrs. P. D. Richards, Wild Flowers	3 00

JULY 1.

ENGLISH IRISES.— Best Collection, Walter H. Cowing	3 00
DELPHINIUMS.— Collection of twenty spikes, R. & J. Farquhar & Co.	5 00
FOXGLOVES.— Twelve spikes, Nathaniel T. Kidder	2 00
Second, Walter H. Cowing	1 00
HERBACEOUS PLANTS.—Forty bottles, Shady Hill Nursery Co.	8 00
BASKET OF FLOWERS.— Mrs. A. D. Wood	5 00
Second, Mrs. E. M. Gill	4 00

Gratuities : —

Hon. Joseph S. Fay, Collection of Hardy Roses	15 00
Francis Brown Hayes, " " " "	15 00
J. Eaton Jr., " " " "	4 00
William H. Spooner, " " " "	2 00
Charles W. Parker, " " " "	1 00
Charles W. Parker, " " Roses	1 00
Nathaniel T. Kidder, " " Herbaceous Plants	4 00
Rea Brothers, Herbaceous Plants	1 00
Walter H. Cowing, Collection of Sweet Williams	2 00
Frederick S. Davis, " " " "	1 00
E. Sheppard & Son, " " " "	1 00
Walter H. Cowing, Vase of Shirley Poppies	1 00
Daniel D. Lee, Nymphæas	1 00
Benjamin D. Hill, Cut Flowers	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. P. D. Richards, Wild Flowers	2 00

JULY 8.

VASE OF FLOWERS.— Best arranged, in one of the Society's glass vases, Mrs. A. D. Wood	4 00
Second, Mrs. E. M. Gill	3 00
NATIVE PLANTS.— Collection, not exceeding forty bottles, Mrs. P. D. Richards	5 00
Second, Walter E. Coburn	4 00

Gratuities : —

Joseph S. Fay, Hybrid Roses and Delphiniums	10 00
R. & J. Farquhar & Co., Delphiniums	3 00
Charles W. Parker, Hybrid Roses	2 00
Leverett M. Chase, *Lilium candidum*	4 00
Frederick S. Davis, " "	2 00
Bussey Institution, " "	2 00

Isaac E. Coburn, Pelargoniums, etc.	$3 00
E. Sheppard & Son, *Iris Kæmpferi*	3 00
Frederick S. Davis, " "	1 00
Bussey Institution, English Irises	1 00
Elisha S. Converse, Tuberous Begonias	1 00
Benjamin D. Hill, Cut Flowers	2 00
Mrs. E. M. Gill, " "	2 00

JULY 15.

PARLOR BOUQUETS.— Mrs. A. D. Wood	4 00
Second, Mrs. E. M. Gill	3 00
Third, George B. Gill	2 00
Gratuities : —	
Thomas C. Thurlow, Delphiniums	3 00
Charles W. Parker, Roses	2 00
E. Sheppard & Son, *Iris Kæmpferi*	2 00
Adin A. Hixon, Petunias, etc.	2 00
Isaac E. Coburn, Tuberous Begonias, etc.	2 00
Frederick S. Davis, Shirley Poppies	1 00
Francis Brown Hayes, Cut Flowers	4 00
Mrs. E. M. Gill, " "	2 00
Benjamin D. Hill, " "	2 00
Mrs. A. D. Wood, " "	1 00
Rea Brothers, " "	1 00
Mrs. S. H. Coleman, " "	1 00
Mrs. P. D. Richards, Wild Flowers	1 00
Miss Charlotte M. Endicott, Wild Flowers	1 00

JULY 22.

HOLLYHOCKS.— Double, twelve blooms, of twelve distinct colors, Hon. Joseph S. Fay	5 00
Second, E. Sheppard & Son	4 00
Six blooms, of six distinct colors, Hon. Joseph S. Fay	3 00
Second, Hon. Joseph S. Fay	2 00
Twelve spikes, Hon. Joseph S. Fay	5 00
GLOXINIAS.— Display of Cut Flowers, the second prize to E. S. Converse	3 00
NATIVE FERNS.— Best display, Mrs. P. D. Richards	5 00
Second, Walter E. Coburn	4 00
Gratuities :—	
Hon. Joseph S. Fay, Hollyhocks	10 00
Charles W. Parker, Roses	1 00
Joseph Breck & Sons Corporation, Collection of Sweet Peas	2 00
Walter E. Coburn, Sweet Peas, etc.	2 00
Charles E. Richardson, *Lilium auratum* and *Lilium speciosum* Melpomene	1 00

Hon. Joseph R. Leeson, *Magnolia fœtida*	$1 00
Daisy Vivian, Nasturtiums	1 00
Benjamin D. Hill, Clematis, etc.	1 00
Rea Brothers, Herbaceous Plants	1 00
Francis Brown Hayes, Cut Flowers	3 00
Mrs. E. M. Gill, " "	2 00
Mrs. A. D. Wood, " "	2 00
E. Sheppard & Son, " "	1 00

JULY 29.

SWEET PEAS.— Display, filling thirty vases, Adin A. Hixon	6 00
Second, George S. Harwood	4 00
Third, Mrs. E. M. Gill	3 00
HERBACEOUS PLANTS.— Forty bottles, Shady Hill Nursery Co.	8 00
BASKET OF FLOWERS.— Mrs. E. M. Gill	4 00
Second, Mrs. A. D. Wood	3 00
Gratuities :—	
Hampden Co. Horticultural Society, Sweet Peas	3 00
George S. Harwood, Sweet Peas	3 00
Nathaniel T. Kidder, Herbaceous Plants	5 00
Joseph Burnett, Hollyhocks	5 00
Daniel D. Lee, Water Lilies	2 00
Adin A. Hixon, Petunias	2 00
John Parker, Dahlias and Cut Flowers	1 00
Francis Brown Hayes, Cut Flowers	4 00
Walter E. Coburn, " "	2 00
E. Sheppard & Son, " "	2 00
Benjamin D. Hill, " "	2 00
Mrs. E. M. Gill, " "	2 00
Rea Brothers, " "	1 00
Mrs. P. D. Richards, Wild Flowers	2 00

AUGUST 5.

PERENNIAL PHLOXES.— Ten distinct named varieties, Thomas C. Thurlow	5 00
Second, Shady Hill Nursery Co.	4 00
Third, Rea Brothers	3 00
VASE OF FLOWERS.— Mrs. A. D. Wood	4 00
Second, Mrs. E. M. Gill	3 00
NATIVE FLOWERS.— Collection, not exceeding forty bottles, Mrs. P. D. Richards	5 00
Second, Misses Eleanor and Mollie Doran	4 00
Third, Walter E. Coburn	3 00
Gratuities :—	
R. W. Williams, Salpiglossis	1 00
Elisha S. Converse, Begonias	1 00

Francis Brown Hayes, Cut Flowers	$3 00
Mrs. E. M. Gill, " "	2 00
Mrs. S. H. Coleman, " "	1 00
Agnes A. Fisher, Native Flowers	1 00

AUGUST 12.

GLADIOLI.— Twenty named varieties, in spikes, Francis Brown Hayes	6 00
Ten named varieties, in spikes, Francis Brown Hayes	3 00
Six named varieties, in spikes, " " "	2 00
Display of named and unnamed varieties, filling one hundred vases, George M. Anderson	8 00
PHLOX DRUMMONDI.— Thirty vases, not less than six varieties, Mrs. Mary T. Goddard	4 00
Second, William Patterson	3 00

Gratuities :—

George M. Anderson, Gladioli	2 00
Francis Brown Hayes, Roses, Phlox, etc.	4 00
Adin A. Hixon, Petunias and Sweet Peas	4 00
Walter E. Coburn, Sweet Peas and Petunias	2 00
Edwin S. Hill, Collection of Petunias	1 00
John C. Hovey, *Ipomœa leptophylla*	1 00
E. Sheppard & Son, Zinnias, etc.	1 00
John Parker, Collection of Dahlias	2 00
William C. Winter, Collection of Dahlias and Begonias	2 00
Mrs. E. M. Gill, Cut Flowers	1 00
Mrs. P. D. Richards, Wild Flowers	2 00

AUGUST 19.

Gratuities :—

J. Warren Clark, Gladioli	4 00
E. Sheppard & Son, "	3 00
Dr. C. G. Weld, "	2 00
William E. Endicott, Seedling Gladioli	1 00
William C. Strong, Gladioli and Lilies	1 00
Walter E. Coburn, Petunias and Begonias	2 00
Aaron Lummus, Dahlias	2 00
John Parker, "	2 00
Nathaniel T. Kidder, Asters	3 00
Mrs. S. H. Coleman, "	1 00
Mrs. E. M. Gill, Zinnias	1 00
Rea Brothers, Perennial Phlox	1 00
Benjamin D. Hill, Clematis	1 00
Francis Brown Hayes, Cut Flowers	8 00
George Hollis, Native Asters	1 00

AUGUST 26.

ASTERS.— Large Flowered, of all classes, fifty vases, not less than twelve varieties, William Patterson	$5 00
Second, Charles H. Yates	4 00
Third, Francis Brown Hayes	3 00
Truffaut's Pæony Flowered, thirty blooms, not less than twelve varieties, F. P. Alexander	5 00
Second, Joseph H. White	4 00
Victoria Flowered, thirty blooms, not less than twelve varieties, Nathaniel T. Kidder	5 00
Second, William Patterson	4 00
Pompon, thirty cut plants, not less than six varieties, the second prize to Adin A. Hixon.	3 00
HERBACEOUS PLANTS.— Forty bottles, Shady Hill Nursery Co.	8 00

Gratuities : —

Francis Brown Hayes, Asters	12 00
E. Sheppard & Son, "	2 00
Charles H. Yates, "	1 00
Rea Brothers, Herbaceous Plants	1 00
J. Warren Clark, Gladioli	4 00
Mrs. E. M. Gill "	1 00
Adin A. Hixon, Petunias and Tuberous Begonias	2 00
John Parker, Dahlias	2 00
E. Sheppard & Son, Dahlias	1 00
Aaron Lummus "	1 00
Benjamin D. Hill, Clematis, etc.	1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 6 AND 7.

Special Prize, Theodore Lyman Fund.

AQUATIC PLANTS.— Display, including not less than twelve flowers of Nymphæas and Nelumbiums, John Simpkins	30 00
Second, William Tricker, Dongan Hills, N. Y.	20 00

Regular Prizes.

ASTERS.— Collection of fifty varieties, one flower in each vase, Charles H. Yates	5 00
Second, William Patterson	4 00
Third, Francis Brown Hayes	3 00
DAHLIAS.— Double, twelve blooms, distinct named varieties, John Parker	6 00
Second, William C. Winter	5 00
Third, " " "	4 00

Six blooms, distinct named varieties, William C. Winter	$4 00
Second, William C. Winter	3 00
Third, John Parker	2 00
Specimen bloom, John Parker	2 00
Second, William C. Winter	1 00
Liliputian, display, twenty-five bottles, not less than eight named varieties, William C. Winter	4 00
Second, William C. Winter	3 00
Third, Aaron Lummus	2 00
LILIUM LANCIFOLIUM.— Collection of named varieties, the second prize to Benjamin D. Hill	3 00
TROPÆOLUMS.— Display, filling twenty-five vases, William Patterson	4 00
Second, A. L. Cain	3 00
MARIGOLDS.— Display, filling twenty-five vases, Mrs. E. M. Gill,	3 00
Second, A. L. Cain	2 00
CANNAS.— Collection of not less than ten named varieties, in spikes, with foliage, David Fisher	6 00
TUBEROUS BEGONIAS.— Twelve spikes, not less than four varieties, Walter E. Coburn	5 00
Second, Elisha S. Converse	4 00
Third, William C. Winter	3 00
DOUBLE ZINNIAS.— Twenty-five flowers, not less than six varieties, E. Sheppard & Son	4 00
Second, Francis Brown Hayes	3 00
Third, Mrs. E. M. Gill	2 00
DIANTHUS.— Collection of Annual and Biennial varieties, filling fifty bottles, William Patterson	4 00
BASKET OF FLOWERS.— Mrs. A. D. Wood	4 00
Second, Mrs. E. M. Gill	3 00
NATIVE PLANTS.— Collection, not exceeding forty bottles, Misses Eleanor and Mollie Doran	5 00
Second, Mrs. P. D. Richards	4 00

Gratuities.: —

Charles H. Yates, Asters	4 00
William C. Winter, Dahlias	4 00
Rea Brothers, Cactus Dahlias	1 00
J. Warren Clark, Gladioli	6 00
David Fisher, *Clematis paniculata*	2 00
Walter E. Coburn, Petunias and Begonias	3 00
Mrs. Julia A. Cain, Geraniums and other Cut Flowers	2 00
William Patterson, Gloxinias	1 00
Francis Brown Hayes, Display of Flowers	10 00
Mrs. A. D. Wood, Cut Flowers	2 00
Benjamin D. Hill, " "	2 00
E. Sheppard & Son, " "	1 00

SEPTEMBER 16.

HERBACEOUS PLANTS.— Forty bottles, Shady Hill Nursery Co.	$8 00
Gratuities: —	
Nathaniel T. Kidder, Herbaceous Plants	5 00
Rea Brothers, " "	2 00
J. Warren Clark, Gladioli	5 00
R. & J. Farquhar & Co., Collection of Cannas	4 00
William C. Winter, Dahlias and Tuberous Begonias	4 00
Walter E. Coburn, Petunias, Pansies, and Begonias	3 00
Ettore Tassinari, Phlox and Zinnias	2 00
Elisha S. Converse, Tuberous Begonias	1 00
Francis Brown Hayes, Cut Flowers	4 00
Mrs. E. M. Gill, " "	1 00
Benjamin D. Hill, " "	1 00

SEPTEMBER 23.

PERENNIAL ASTERS.— Display of native or introduced species and varieties, George Hollis	5 00
Second, Mrs. P. D. Richards	4 00
Third, Shady Hill Nursery Co.	3 00
Gratuities: —	
William C. Winter, Dahlias	5 00
John Parker, "	3 00
J. Warren Clark, Gladioli	2 00
Rea Brothers, Herbaceous Plants	1 00
Mrs. A. D. Wood, Cut Flowers	1 00
Mrs. E. M. Gill, " "	1 00
Benjamin D. Hill, " "	1 00

SEPTEMBER 30.

Gratuity:—	
Francis Brown Hayes, Rhododendrons and Begonias	1 00

OCTOBER 4.

Gratuities: —	
L. W. Goodell, Pansies, Begonias, Phlox, etc.	4 00
E. Frank Close, Tuberous Begonias	1 00
Francis Brown Hayes, Cut Flowers and Foliage	7 00
Mrs. A. D. Wood, Cut Flowers	2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

Special Prizes from the Josiah Bradlee Fund.

CHRYSANTHEMUMS. — Twenty-five blooms of twenty-five distinct varieties, named, Joseph H. White, a piece of plate, or value in money	20 00
Second, Elijah A. Wood	15 00
Third, Dr. C. G. Weld	10 00

Six vases of six named varieties, ten blooms each, Charles V. Whitten	$30 00
Second, Mrs. A. D. Wood	25 00

Special Prize Offered by Miss Simpkins.

Twelve cut blooms of any pink Chrysanthemum, Edmund M. Wood & Co., variety Viviand Morel, a Silver Cup, value	40 00

Special Prizes Offered by Edward Hatch.

Best vase of twenty blooms of yellow Chrysanthemums, Charles V. Whitten, variety William H. Lincoln	25 00
Second, William Edgar, variety William H. Lincoln	15 00

Special Prizes Offered by the Society.

Best Seedling, never disseminated, three blooms, red, Joseph H. White, variety Mrs. Joseph H. White	5 00
Best Seedling, never disseminated, three blooms, pink, T. D. Hatfield, variety Sweet Brier	5 00
Best Seedling, never disseminated, three blooms, white, Mann Brothers, variety Mutual Friend	5 00
Best Seedling, never disseminated, three blooms, yellow, T. D. Hatfield, variety A. H. Fewkes	5 00
Best Seedling, never disseminated, three blooms, any other color, Pitcher & Manda, variety Pitcher & Manda	5 00

Regular Prizes.

Twelve cut blooms, Incurved, named, Joseph H. White	10 00
Twelve cut blooms, Japanese, named, John Simpkins	10 00
Second, Joseph H. White	6 00
Third, T. D. Hatfield	4 00
Twelve cut blooms, Japanese Incurved, named, Joseph H. White	10 00
Second, Elijah A. Wood	6 00
Third, T. D. Hatfield	4 00
Six cut blooms, Incurved, named, Joseph H. White	6 00
Second, Joseph H. White	4 00
Third, Elijah A. Wood	2 00
Six cut blooms, Japanese, named, John Simpkins	6 00
Second, Joseph H. White	4 00
Third, Elijah A. Wood	2 00
Six cut blooms, Japanese Incurved, named, John Simpkins	6 00
Second, Joseph H. White	4 00
Third, Elijah A. Wood	2 00
Six cut blooms, Reflexed, named, Elijah A. Wood	6 00
Second, Elisha S. Converse	4 00
Six cut blooms, Anemone, named, Dr. C. G. Weld	6 00

Vase of blooms, on long stems, arranged in the Society's large China vases, John Simpkins	$18 00
Second, Joseph H. White	16 00
Fourth, Mrs. E. M. Gill	12 00
Best vase of ten blooms, on long stems, red, named, Edmund M. Wood & Co., variety Cullingfordii	10 00
Second, Norris F. Comley, variety Alice Comley	8 00
Best vase of ten blooms, on long stems, pink, named, Edmund M. Wood & Co., variety Harry Balsley	10 00
Second, Edmund M. Wood & Co., variety Roslyn	8 00
Third, William Edgar, variety Mrs. Irving Clark	6 00
Best vase of ten blooms, on long stems, white, named, John Simpkins, variety Mrs. Jerome Jones	10 00
Second, Edmund M. Wood & Co., variety Niveus	8 00
Third, John Simpkins, variety Niveus	6 00
Best vase of ten blooms, on long stems, yellow, Edmund M. Wood & Co., variety Golden Wedding	10 00
Best vase of ten blooms, on long stems, any other color, named, Edmund M. Wood & Co., variety Harry May	10 00
Second, Edmund M. Wood & Co., variety Joey Hill	8 00

Gratuities: —

Francis Brown Hayes, Pyramid of Chrysanthemums and Pine Foliage	15 00
Francis Brown Hayes, Collection of Chrysanthemums	10 00
Mrs. A. D. Wood, Vase of Chrysanthemums	10 00
Mrs. A. D. Wood, Vase of blooms of Chrysanthemum Mrs. Jerome Jones	4 00
Joseph H. White, Collection of Chrysanthemums	3 00
Elisha S. Converse, " " "	3 00
George Putnam School, eight varieties of Hardy Chrysanthemums	3 00
J. F. Huss, Skeletonized Foliage and Flowers	5 00
Mann Brothers, Two vases Carnations, Daybreak and New Jersey	2 00
William Nicholson, Carnations	2 00
David Allan, Cut Orchids	2 00
William C. Winter, Tuberous Begonias	1 00

NOVEMBER 18.

Gratuities: —

Francis Brown Hayes, Collection of Chrysanthemums	5 00
George Sanderson, Carnations	1 00

DECEMBER 2.

Francis Brown Hayes, Collection of Chrysanthemums	3 00
T. D. Hatfield, Vase of Chrysanthemum Eiderdown	2 00

SOCIETY'S GOLD MEDAL.

Rhododendron Show, June 13, 14. Francis Brown Hayes, Display of Rhododendrons.

SOCIETY'S SILVER MEDALS.

Rhododendron Show, June 13, 14. Hon. Joseph S. Fay, Display of Flowering Trees and Shrubs.

October 4. J. Warren Clark, Seedling Gladioli.

November 7. Arthur H. Fewkes, Seedling Canna 2–'93.

APPLETON SILVER MEDALS.

Shady Hill Nursery Co., Best Collection of Herbaceous Plants, exhibited at stated times during the season, as specified in the Schedule.

Rose Show, June 22 and 23. Thomas C. Thurlow, Collection of Herbaceous Pæonies.

FIRST CLASS CERTIFICATES OF MERIT.

March 4. James McGreggor, New Seedling Carnation Jacqueminot.

Spring Exhibition, March 21. Joseph Tailby & Son, Self Yellow Seedling Carnation Henriette Sargent.

Rhododendron Show, June 13, 14. J. W. Manning, Seedling *Papaver orientale.*

Rose Show, June 22, 23. Hicks Arnold, *Lælia Arnoldiana.*

" " " " Jackson Dawson, Seedling Hybrid Rose, No. 3, Multiflora × Gen. Jacqueminot.

" " " " Jackson Dawson, Seedling Hybrid Rose, No. 2, Multiflora × Miss Hassard.

July 1. M. H. Walsh, Seedling Hybrid Perpetual Rose Michael H. Walsh.

July 29. Fisher Brothers & Co., Seedling Sweet Pea Snowflake.

August 12. Thomas H. Flynn, New Canna Florence Vaughn.

September 30. Jackson Dawson, *Astilbe Chinensis* var. *Japonica.*

October 14. Arthur H. Fewkes, Seedling Canna 2–'93.

October 28. J. T. Clarke, Seedling Chrysanthemum 1–'93.

Chrysanthemum Show, November 7. Pitcher & Manda, Short Hills, N. J., Seedling Chrysanthemum Pitcher & Manda.

" " " " Pitcher & Manda, Seedling Chrysanthemum Dorothy Toler.

" " " " Mann Brothers, Seedling Chrysanthemum Mutual Friend.

" " " " T. D. Hatfield, Seedling Chrysanthemum A. H. Fewkes.

" " " " Edwin Lonsdale, Philadelphia, Pa., Seedling Carnation Helen Keller.

" " " " William W. Edgar, Seedling Mignonette Edgar's Improved.

" " " " Sewall Fisher, Seedling Carnation Nicholson.

HONORABLE MENTIONS.

February 11. Arthur H. Fewkes, Seedling Geranium.
Spring Exhibition, March 21. Arthur H. Fewkes, Seedling Carnations.
" " " " George B. Gill, " "
" " " " Siebrecht & Wadley, New Rochelle, N. Y., new Hybrid Tea Rose.
" " " " John N. May, Summit, N. J., new Hybrid Tea Rose Mrs. W. C. Whitney.
May 6, William Nicholson, Seedling Carnation Nicholson.
" " " " " " Ada Byron.
Rhododendron Show, June 13. Rea Brothers, *Lychnis flos cuculi alba plena.*
Annual Exhibition, September 6. William Tricker, Dongan Hills, N. Y., *Nymphæa tuberosa hybrida.*

COMPLIMENTARY NOTICES.

Chrysanthemum Show, November 7. James Wheeler, Seedling Chrysanthemum Mrs. Joseph H. White.
" " " " James Brydon, Seedling Chrysanthemum Portia.
" " " " T. D. Hatfield, Seedling Chrysanthemum Mrs. Pethers.
November 18. Norris J. Comley, Seedling Chrysanthemum 1–'93.
" " T. D. Hatfield, Seedling Chrysanthemum Eiderdown.
" " Sewall Fisher, Seedling Carnation Ada Byron.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1893.

By E. W. WOOD, Chairman.

If the exhibitions of fruit during the past season were to be taken as an indication of the fruit product of the State it would be conceded that there had been an abundant crop. Considering that it has been the off, or non-bearing, year for apples in the New England States and that a large portion of the fruit was blown from the trees in August and September, the exhibits have been unusually large. This fact together with similar results within the past few years indicates that under ordinary conditions the variation in the amount of the apple product has been growing less marked — a desirable change for both producer and consumer. The fruit has not been as fair and free from imperfections as when the injurious effects of the insect pests are distributed through an abundant crop, showing the necessity of spraying the trees and protecting the fruit.

Of pears there has been an abundant crop; the market has been over-supplied, and had it not been for the opportunities for cold storage, the returns, especially for the early varieties, would have disappointed the growers. Other conditions were unfavorable for the sale of pears; the general depression in business had its effect and an unusual supply of peaches was put on the market in competition with the earlier varieties.

The crop of peaches has been larger than for several years, and the opinion heretofore expressed in these reports, that improve-

ment in growing this fruit might be expected from raising seedling trees, seems to have received at least partial confirmation in the fact that the proportion of seedling fruit on exhibition has constantly increased for several years. It is claimed for the Crosby peach, a seedling recently introduced, that it passes through the winter with its fruit buds uninjured while the older varieties standing beside it fail to produce fruit. It is generally admitted that continued reproduction by buds and cuttings tends to weaken the constitution of plants and trees. The growers of the peach have been confined almost exclusively to a few varieties for many years; and during this time the trees have been attacked by a disease, often difficult to detect in its earlier stages, rendering it impossible to prevent the use of diseased pits and buds in the propagation of the old varieties. The most direct means of restoring vigor and fruitfulness to the peach would seem to be through growing seedling trees, first securing pits from healthy stock.

Plums have been shown in about the usual quantity, and we cannot look for a large increase in the exhibitions of this fruit until some successful means shall be discovered of combatting the black wart. Some encouraging attempts have been made at the Experiment Stations and it is believed that the difficulty may be overcome by spraying the trees with copper solutions. There have been some Japanese varieties of the plum of excellent quality recently introduced, and deserving the attention of fruit growers. It is claimed that they are not as liable to injury from the wart as the old varieties, but to this it may be answered that they have not been long enough under cultivation here to decide that point.

Very few cherries have been shown. It is surprising that a tree so easily grown and so ornamental, and at the same time bearing a desirable fruit, should be so much neglected. There is hardly any tree more beautiful than the heartshaped varieties of the cherry; growing in upright pyramidal form, with their thick, dark, glossy foliage they form an attractive feature when judiciously planted around the buildings.

Quinces have been shown in larger quantities than for several years. This fruit has not realized satisfactory prices in the market, which fact cannot be attributed to its quality, as it is one of the most desirable fruits for preserves and jellies, either alone or with other fruits, to which it imparts its peculiarly agreeable flavor. The Orange variety is the most generally grown, but the

finest specimens shown at the exhibitions were the Rea and Champion varieties.

The weekly exhibitions through the season have been well sustained. The amount of small fruits shown has been above the average in past years. The Strawberry Exhibition was interesting in various directions; the fruit as a whole was of superior quality; unusual interest was shown in the new varieties, and the competition in the different classes was more generally filled than usual. Of the new varieties the Marshall was easily the most marked; entered in four classes it took the first prize in every class. It is a very promising berry, and if its cultivation in other localities proves as successful as in the place of its origin, it must soon become one of the leading varieties. The Hersey Columbia took the first prize for any "new variety not previously exhibited." It is above medium size, of good form, dark color, and good quality. It is claimed to be an exceedingly good cropper, and seems to be promising and worthy of trial. It is gratifying to see the increased interest in growing seedling strawberries; experience has shown that the profitable life of most of the varieties of the strawberry has not lasted more than ten years, when they have been replaced by new and more desirable kinds. Any additions that will increase the size, or improve the quality, or extend the season by earlier or later varieties, will be welcomed by both growers and consumers.

At the Annual Fruit Exhibition, notwithstanding it was the off year for apples, there was an unusual amount of fruit shown. The pear exhibit was exceptionally large and of superior quality, and for the first time in many years every prize offered was awarded. A still more remarkable fact of this exhibition was that all the prizes offered for peaches were awarded, and at the exhibition of September 16, when a longer list of prizes was offered for peaches, all were awarded except for one variety.

Recognizing the fact that a large proportion of the preserved fruit sold in this market is imported from foreign countries, and that evaporated fruit had become an important and profitable industry in some of the states, the Committee of Arrangements have been considering for the past two years the propriety of inviting the dealers in preserved and evaporated fruits to make an exhibit in connection with our Annual Fruit Exhibition. As this would only show the finished product it was thought that an

exhibition of the process of manufacturing it might prove of more practical advantage to the fruit growers, and an invitation was extended to one of the largest concerns in the country, engaged in evaporating fruit largely for export trade, to bring one of their medium sized machines and keep it in operation during our Annual Exhibition. It proved a very interesting feature of the exhibition and attracted much attention. At the close of the exhibition the machine was purchased by the Agricultural College at Amherst, where it has been in operation up to the present time. The following statistics will show the importance of information on this subject to the fruit growers in Massachusetts. There were exported during the five years from 1870 to 1875, 13,348,746 pounds of evaporated fruit, returning a value of $716,894. For the five years from 1888 to 1893 the amount was 87,782,433 pounds, returning a value of $4,750,141. Of the evaporated fruit shipped during the last five years 62,300,000 pounds were shipped from New York and only 607,000 pounds from Boston.

As usual the fruit shown at the last exhibition, November 18, was the finest in quality of any shown during the year.

Of new fruits shown, F. H. Frazier, Danville, Indiana, exhibited, January 7, Arnold pears, a late seedling variety of very good quality, and was awarded a First Class Certificate of Merit. February 4, Edwanger & Barry, Rochester, N. Y., showed five varieties of winter pears; they were fair in quality but would be chiefly desirable for their late keeping qualities. They received Honorable Mention. September 6, Charles H. Hovey, East Pasadena, California, showed a very fine collection of oranges and lemons, and was awarded a Bronze Medal.

The Committee have awarded during the year in prizes and gratuities $1,592, leaving an unexpended balance of $208.

E. W. Wood,
Benj. G. Smith,
Chas. F. Curtis,
O. B. Hadwen,
Warren Fenno,
Samuel Hartwell,
J. W. Hill,
Committee on Fruits.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 7.

Gratuities : —

Asa Clement, Apples	$1 00
John L. Bird, Pears	1 00
F. H. Frazier, Danville, Indiana, Arnold Pears, First Class Certificate of Merit.	
Francis Brown Hayes, Japanese Lemons	1 00
G. L. Simmons, English Walnuts	1 00

February 4.

Gratuities : —

Ellwanger & Barry, Rochester, N. Y., New Winter Pears, Honorable Mention.	
William C. Eustis, Collection of Apples	2 00
Edwin A. Hall, Pears	1 00
A. H. Lewis, Apples and Pears	1 00

SPRING EXHIBITION.

March 21, 22, 23, and 24.

Winter Apples. — Baldwin, Marshall W. Chadbourne	3 00
Second, Rev. Calvin Terry	2 00
Third, O. B. Hadwen	1 00
Northern Spy, George C. Rice	3 00
Second, William T. Hall	2 00
Third, Asa Clement	1 00
Roxbury Russet, Asa Clement	3 00
Second, George Sanderson	2 00
Third, Elisha S. Converse	1 00
Tompkins King, George C. Rice	3 00
Second, William C. Eustis	2 00
Any other variety, O. B. Hadwen, Palmer	3 00
Second, Samuel Hartwell, Rome Beauty	2 00
Third, George Sanderson	1 00
Winter Pears.— Any variety, A. H. Lewis, Glout Morceau	3 00
Second, Edwin A. Hall, Winter Nelis	2 00

April 6.

Gratuities : —

Warren Heustis & Son, Baldwin Apples	1 00
Edwin A. Hall, Collection of Pears	2 00

MAY 13.

Gratuities: —

William Brown, Peaches	$2 00
Benjamin P. Ware, Apples	1 00

MAY 20.

Gratuity: —

William Brown, Peaches	2 00

JUNE 13.

Gratuity: —

Winter Brothers, Peaches	2 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes from the Theodore Lyman Fund.

STRAWBERRIES.—For the best four quarts of any variety, Marshall F. Ewell, Marshall	$20 00
Second, George F. Wheeler, Leader	16 00
Third, George V. Fletcher, Bubach	12 00

Special Prizes Offered by the Society.

For the best two quarts of any variety, to be judged by points, Marshall F. Ewell, Marshall	6 00
Second, Isaac E. Coburn, Jessie	5 00
Third, George V. Fletcher, Jessie	4 00
Fourth, Hon. Joseph S. Fay, Parry	3 00
For the best ten baskets, of two quarts each, and not less than three varieties, Isaac E. Coburn	15 00
Second, George V. Fletcher	12 00
Third, George F. Wheeler	10 00
Five baskets, two quarts each, of one variety, Marshall F. Ewell, Marshall	8 00
Second, William Doran & Son, Sharpless	6 00
Third, George F. Wheeler, Leader	5 00
Two quarts of Belmont, George V. Fletcher	4 00
Second, William Doran & Son	3 00
Third, George F. Wheeler	2 00
Bubach, Isaac E. Coburn	4 00
Second, George V. Fletcher	3 00
Third, John L. Gardner	2 00
Champion, George V. Fletcher	4 00
Second, George F. Wheeler	3 00
Third, Wilfred Wheeler	2 00

Charles Downing, William Doran & Son	$4 00
Second, George F. Wheeler	3 00
Third, Nathaniel T. Kidder	2 00
Crescent, Isaac E. Coburn	4 00
Second, George F. Wheeler	3 00
Cumberland, William Patterson	4 00
Second, Wilfred Wheeler	3 00
Third, George F. Wheeler	2 00
Jessie, George V. Fletcher	4 00
Second, Isaac E. Coburn	3 00
Third, Elisha S. Converse	2 00
Jewell, George V. Fletcher	4 00
Second, Mrs. Mary T. Goddard	3 00
Leader, George F. Wheeler	4 00
Miner's Prolific, George F. Wheeler	4 00
Sharpless, William Doran & Son	4 00
Second, Hon. Joseph S. Fay	3 00
Third, Charles E. Grant	2 00
Wilder, William G. Prescott,	4 00
Any other variety, Marshall F. Ewell, Marshall	4 00
Second, Bela F. Lincoln, Hersey Columbia	3 00
Third, Isaac E. Coburn, Haverland	2 00
Collection of not less than six varieties, one quart each, George V. Fletcher,	8 00
Second, George F. Wheeler	6 00
One quart of any new variety, not previously exhibited, Bela F. Lincoln, Hersey Columbia	3 00
Second, Samuel H. Warren, Weston	2 00
Cherries.— Two quarts of any variety, Oliver R. Robbins	2 00
Foreign Grapes.— Two bunches of any variety, Elisha S. Converse, Black Hamburg	6 00
Second, Winter Brothers, Muscat of Alexandria	4 00
Peaches.— Six specimens of any variety, Winter Brothers, Waterloo	3 00
Second, Winter Brothers, Amsden	2 00

Gratuities:—

Benjamin P. Ware, Apples	1 00
Edwin A. Hall, Pears	1 00

July 1.

Strawberries.— One quart of any variety, Marshall F. Ewell, Marshall	3 00
Second, Hon. Joseph S. Fay, Belmont	2 00
Third, George V. Fletcher, Jessie	1 00

CHERRIES.— Black Tartarian, Leverett M. Chase	$3 00
Second, George V. Fletcher	2 00
Third, Edwin Hastings	1 00
Coe's Transparent, Leverett M. Chase	3 00
Any other variety, Winter Brothers, Gov. Wood	3 00
Second, Marshall W. Chadbourne, White Heart	2 00

Gratuities : —

Winter Brothers, Hamburg Grapes and Strawberries	2 00
James G. Allen, Yarmouth, Nova Scotia, Seedling Strawberries, Honorable Mention.	

JULY 8.

CHERRIES.— Two quarts of any variety, George S. Curtis, Black Tartarian	3 00
Second, Marshall W. Chadbourne, Downer	2 00
Third, John L. Bird, Coe's Transparent	1 00
RASPBERRIES.— Two quarts of any variety, William Doran & Son, Highland Hardy	3 00
Second, Charles E. Grant, Cuthbert	2 00
CURRANTS.— Two quarts of any red variety, William Doran & Son, Versaillaise	4 00
Second, Benjamin G. Smith, Fay	3 00
Third, Sumner Coolidge, Fay	2 00
Two quarts of any white variety, Benjamin G. Smith, French Transparent	3 00
Second, Benjamin G. Smith, White Gondouin	2 00

Gratuity : —

Winter Brothers, Foreign Grapes	1 00

JULY 15.

RASPBERRIES.— Collection of not less than four varieties, two quarts each, William Doran & Son	4 00
Two quarts of any variety, William Doran & Son, Hornet	3 00
Second, Benjamin G. Smith, Franconia	2 00
CURRANTS.— One quart of Versaillaise, William Doran & Son	2 00
Second, Benjamin G. Smith	1 00
One quart of any other red variety, Benjamin G. Smith, Fay	2 00
Second, Francis Brown Hayes, Fay	1 00
One quart of any white variety, Elisha S. Converse, White Grape	2 00
Second, Benjamin G. Smith, Dana's Transparent	1 00
GOOSEBERRIES.— Two quarts of any Native variety, Joseph S. Chase, Triumph	3 00
Second, Dr. Walter G. Kendall, Downing	2 00
Third, Elisha S. Converse, Downing	1 00

Gratuities: —

Amos Bates, Seedling Gooseberries, Silver Medal.	
Elisha S. Converse, Foreign Grapes	$1 00
Charles N. Brackett, Cherries	1 00
Charles S. Smith, "	1 00
George S. Curtis, "	1 00

JULY 22.

RASPBERRIES.— Two quarts of any variety, Mrs. E. J. Cutter, Cuthbert	3 00
Second, Charles E. Grant, Cuthbert	2 00
Third, Benjamin G. Smith, Franconia	1 00
CURRANTS.— One quart of any Red variety, Elisha S. Converse, Fay	3 00
Second, Benjamin G. Smith, Versaillaise	2 00
Third, Benjamin G. Smith, Fay	1 00
One quart of any White variety, Benjamin G. Smith, Dana's Transparent	2 00
Second, Elisha S. Converse, White Grape	1 00
BLACKBERRIES.— Two quarts of any variety, Dr. Walter G. Kendall, Lucretia	3 00
GOOSEBERRIES.— Two quarts of any Foreign variety, Winter Brothers, Crown Bob	3 00
Second, William G. Prescott, Industry	2 00
Third, George S. Harwood, "	1 00

Gratuities: —

Charles N. Brackett, Cherries	1 00
Winter Brothers, Grapes	1 00

JULY 29.

BLACKBERRIES.— Two quarts of any variety, Dr. Walter G. Kendall, Lucretia	3 00
Second, Marshall W. Chadbourne, Dorchester	2 00
Third, William C. Eustis, "	1 00
APPLES.— Tetofsky, Samuel Hartwell	3 00
Second, Marshall W. Chadbourne	2 00
PEARS.— Summer Doyenne, Charles N. Brackett	3 00
Second, Benjamin G. Smith	2 00
Third, Leverett M. Chase	1 00
Any other variety, Charles N. Brackett, Giffard	3 00
Second, Rev. Calvin Terry, Madeleine	2 00
Third, Marshall W. Chadbourne, Osband's Summer	1 00
PEACHES.— Any variety, Charles S. Smith, Alexander	3 00
Second, E. J. Cutter, Page's Seedling	2 00

Gratuities: —

Winter Brothers, Collection	2 00
Peter Fisher, Foreign Grapes	2 00

AUGUST 5.

APPLES.— Red Astrachan, the second prize to Samuel Hartwell	$2 00
Third, Winter Brothers	1 00
Sweet Bough, George V. Fletcher	3 00
Second, Warren Heustis & Son	2 00
Third, Samuel Hartwell	1 00
Any other variety, Charles F. Curtis, Williams	3 00
Second, Charles N. Brackett, Early Margaret	2 00
Third, Varnum Frost, Tetofsky	1 00
PEARS.— Giffard, Rufus T. Tobey	3 00
Second, Charles N. Brackett	2 00
Third, Warren Fenno	1 00
Any other variety, Charles N. Brackett, Bloodgood	3 00
Second, Elisha S. Converse, Bloodgood	2 00
Third, Charles N. Brackett, Jargonelle	1 00
BLACKBERRIES.—Two quarts of any variety, Dr. Walter G. Kendall, Lucretia	3 00
Second, E. W. Wood, Kittatinny	2 00
Third, Marshall W. Chadbourne, Dorchester	1 00
PEACHES.— Any variety, J. W. Page, Page's Seedling	3 00
Second, William G. Prescott, Early Canada	2 00
Third, Winter Brothers, Waterloo	1 00
Gratuity:—	
Andrew Wellington, Apricots	1 00

AUGUST 12.

APPLES.— Oldenburg, William T. Hall	3 00
Any other variety, Samuel Hartwell, Williams	3 00
Second, Marshall W. Chadbourne, "	2 00
Third, Varnum Frost, "	1 00
PEARS.— Clapp's Favorite, Charles N. Brackett	3 00
Second, Marshall W. Chadbourne	2 00
Third, Warren Fenno	1 00
Manning's Elizabeth, Mrs. Mary Langmaid	2 00
Second, Frank Ware	1 00
Any other variety, Charles N. Brackett, Giffard	2 00
Second, Warren Fenno, Giffard	1 00
APRICOTS.— Any variety, Andrew Wellington	3 00
Second, Charles E. Grant	2 00
Third, Benjamin G. Smith	1 00
PEACHES.— Any variety, Winter Brothers, Waterloo	3 00
Second, William H. Slocum, Page's Seedling	2 00
Third, Nathan D. Harrington, Seedling	1 00
FOREIGN GRAPES.— Any variety, George A. Nickerson, Black Hamburg	5 00
Second, Elisha S. Converse, Black Hamburg	4 00

August 19.

Apples.— Chenango, Charles F. Curtis	$3 00
Second, Samuel Hartwell	2 00
Williams, Varnum Frost	3 00
Second, Walter Russell	2 00
Third, Charles F. Curtis	1 00
Any other variety, Samuel Hartwell, Summer Pippin	3 00
Second, Samuel Hartwell, Gravenstein	2 00
Third, William T. Hall, Oldenburg	1 00
Pears.— Rostiezer, Elisha S. Converse	3 00
Second, Marshall W. Chadbourne	2 00
Third, Charles N. Brackett	1 00
Tyson, Aaron S. McIntosh	3 00
Second, E. J. Hewins	2 00
Third, John L. Bird	1 00
Any other variety, E. W. Wood, Clapp's Favorite	3 00
Second, Marshall W. Chadbourne, Clapp's Favorite	2 00
Third, Elisha S. Converse, " "	1 00
Peaches — Any variety, Nathan D. Harrington, Seedling	3 00
Second, Winter Brothers, Waterloo	2 00
Third, " " Amsden	1 00
Plums.— Any variety, Joseph S. Chase, Botan	3 00
Second, Rufus T. Tobey, Bradshaw	2 00
Third, George V. Fletcher, "	1 00

August 26.

Apples.— Foundling, Asa Clement	3 00
Second, Samuel Hartwell	2 00
Third, Warren Fenno	1 00
Gravenstein, Samuel Hartwell	3 00
Second, C. H. Handley	2 00
Third, George Sanderson	1 00
Maiden's Blush, Warren Fenno	3 00
Second, Dr. Walter G. Kendall	2 00
Third, Winter Brothers	1 00
Porter, Cephas H. Brackett	3 00
Second, Marshall W. Chadbourne	2 00
Third, C. H. Handley	1 00
Summer Pippin, Warren Fenno	3 00
Second, Samuel Hartwell	2 00
Any other variety, Varnum Frost, Williams	3 00
Second, Walter Russell, "	2 00
Third, Asa Clement, "	1 00
Pears.— Andrews, Mrs. Mary Langmaid	3 00
Second, Warren Fenno	2 00
Third, Benjamin G. Smith	1 00

Bartlett, Varnum Frost	$3 00
Second, Mrs. Mary Langmaid	2 00
Third, Leonard W. Weston	1 00
Boussock, John L. Bird	3 00
Second, Warren Fenno	2 00
Third, Mrs. Mary Langmaid	1 00
Any other variety, Aaron S. McIntosh, Tyson	3 00
Second, E. J. Hewins, Tyson	2 00
Third, Elisha S. Converse, Clapp's Favorite	1 00
PEACHES.— Collection, Winter Brothers	4 00
Single dish of any variety, the second prize to Winter Brothers, Hale's Early	2 00
Third, Nathan D. Harrington, Seedling	1 00
PLUMS.— Bradshaw, George V. Fletcher	2 00
Second, Rufus T. Tobey	1 00
Imperial Gage, George V. Fletcher	2 00
Second, Charles E. Grant	1 00
Washington, Mrs. Mary T. Goddard	2 00
Any other variety, Joseph S. Chase, Botan	2 00
Second, Winter Brothers, Smith's Orleans	1 00

SEPTEMBER 6.

Gratuities : —

George McWilliam, Collection of Foreign Grapes, the Appleton Gold Medal.

Charles H. Hovey, East Pasadena, Cal., Collection of Oranges and Lemons, the Society's Bronze Medal.

SEPTEMBER 9.

Gratuity : —

Nathan D. Harrington, Seedling Peaches	1 00

SEPTEMBER 16.

APPLES.—Foundling, Asa Clement	3 00
Gravenstein, Artemas Frost	3 00
Second, Samuel Hartwell	2 00
Third, William T. Hall	1 00
Maiden's Blush, Warren Fenno	3 00
Second, Dr. Walter G. Kendall	2 00
Porter, William Patterson	3 00
Second, Charles S. Smith	2 00
Third, John Parker	1 00
Pumpkin Sweet, Mrs. J. S. Whiting	3 00
Second, Samuel Hartwell	2 00
Any other variety, Warren Fenno, Washington Strawberry	3 00
Second, Warren Fenno, Summer Pippin	2 00
Third, Samuel Hartwell, Holden	1 00

Crab Apples.— Transcendent, Nathan D. Harrington	$2 00
Second, Warren Fenno	1 00
Any other variety, Marshall W. Chadbourne, Hyslop	2 00
Second, E. C. Stone, Russian	1 00
Pears.— Bartlett, A. T. Brown	3 00
Second, William Milman	2 00
Third, Varnum Frost	1 00
Belle Lucrative, Elisha S. Converse	3 00
Second, Clifford R. Weld	2 00
Third, George W. Hall	1 00
Boussock, Charles N. Brackett	3 00
Second, Charles F. Curtis	2 00
Third, John L. Bird	1 00
Hardy, J. J. Oakes	3 00
Second, William Milman	2 00
Third, Charles F. Curtis	1 00
Paradise of Autumn, Leverett M. Chase	3 00
Second, William Milman	2 00
Third, William H. Hunt	1 00
Souvenir du Congrès, Peter W. Pierce	3 00
Second, Dr. Walter G. Kendall	2 00
Third, Warren Fenno	1 00
Any other variety, Nathan D. Harrington, Sheldon	3 00
Second, Thomas M. Davis, Louise Bonne of Jersey	2 00
Third, Elisha S. Converse, Golden Beurre,	1 00
Peaches.— Crawford's Early, J. L. Duncan	3 00
Second, Mrs. Fannie E. Gay	2 00
Third, Mrs. Mary Langmaid	1 00
Foster, John L. Bird	3 00
Second, Nathan D. Harrington	2 00
Third, Samuel Hartwell	1 00
Oldmixon, Leverett M. Chase	3 00
Second, F. J. Kinney	2 00
Third, Charles S. Smith	1 00
Stump the World, Charles E. Grant	3 00
Second, Nathan D. Harrington	2 00
Third, F. J. Kinney	1 00
Any other variety, G. T. Raymond, Seedling	3 00
Second, Nathan D. Harrington, "	2 00
Third, Jackson Dawson, "	1 00
Peaches, Orchard House Culture.— Joseph H. White	4 00
Nectarines.— C. C. Donnell	2 00
Second, Warren Fenno	1 00
Plums.— Bradshaw, George V. Fletcher	2 00
Second, F. J. Kinney	1 00
Imperial Gage, George V. Fletcher	2 00
Second, Charles E. Grant	1 00

Lombard, George V. Fletcher	$2 00
Second, Leverett M. Chase	1 00
Any other variety, Mrs. Mary T. Goddard, Pond's Seedling	2 00
Second, F. J. Kinney, Gen. Hand	1 00
NATIVE GRAPES. — August Rose, William H. Hunt	3 00
Cottage, Samuel G. Damon	3 00
Second, Samuel Hartwell	2 00
Third, Benjamin G. Smith	1 00
Eumelan, Benjamin G. Smith	3 00
Massasoit, F. J. Kinney	3 00
Second, Benjamin G. Smith	2 00
Moore's Early, Samuel Hartwell	3 00
Second, Samuel G. Damon	2 00
Third, Benjamin G. Smith	1 00
Any other variety, F. J. Kinney, Worden	3 00
Second, Samuel Hartwell, "	2 00
Third, Benjamin G. Smith	1 00
Any variety from girdled vines, F. J. Kinney, Worden	3 00
Second, F. J. Kinney, Concord	2 00
Gratuity : —	
Robert Manning, Brown Turkey Figs	1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

OCTOBER 4 AND 5.

Special Prizes, Samuel Appleton Fund.

APPLES.— Baldwin, Marshall W. Chadbourne	5 00
Hubbardston, Artemas Frost	5 00
PEARS.— Bosc, John L. Bird	5 00
Sheldon, Samuel G. Damon	5 00

Benjamin V. French Fund.

APPLES.— Gravenstein, Samuel Hartwell,	5 00
Rhode Island Greening, William O'Connell	5 00

Marshall P. Wilder Fund.

PEARS.— Anjou, A. T. Brown	4 00
Second, William S. Janvrin	3 00
Third, Mrs. Mary Langmaid	2 00
Fourth, Warren Fenno	1 00
Bartlett, Varnum Frost	4 00
Second, A. T. Brown	3 00
Third, Samuel G. Damon	2 00
Fourth, George V. Fletcher	1 00

NATIVE GRAPES.— Concord, George B. Andrews	$3 00
Second, Samuel G. Damon	2 00
Third, F. J. Kinney	1 00
Worden, George B. Andrews	3 00
Second, Samuel Hartwell	2 00
Third, F. J. Kinney	1 00

Theodore Lyman Fund.

FOREIGN GRAPES.—For the heaviest and best ripened bunch of any Black variety, not less than six pounds, Mrs. J. W. Clark	10 00

Special Prizes Offered by the Society.

PEARS.— Anjou, Cephas H. Brackett	5 00
Seckel, Marshall W. Chadbourne	5 00
PEACHES.— Any variety, Samuel Hartwell	5 00
NATIVE GRAPES.— Any variety, George B. Andrews	5 00

REGULAR PRIZES.

Theodore Lyman Fund.

APPLES.— Baldwin, William Patterson	4 00
Second, E. R. Cook	3 00
Third, George V. Fletcher	2 00
Fall Orange, Asa Clement	3 00
Second, Charles S. Smith	2 00
Third, C. H. Handley	1 00
Fameuse, H. Whittaker	3 00
Second, Artemas Frost	2 00
Third, Marshall W. Chadbourne	1 00
Fletcher Russet, John Fletcher	3 00
Second, William H. Teele	2 00
Foundling, Asa Clement	3 00
Gloria Mundi, Mrs. John Clark	3 00
Second, Samuel Hartwell	2 00
Third, E. R. Cook	1 00
Golden Russet, Warren Fenno	2 00
Gravenstein, Samuel Hartwell	4 00
Second, Artemas Frost	3 00
Third, H. Whittaker	2 00
Hubbardston, Marshall W. Chadbourne	4 00
Second, John Parker	3 00
Third, Leonard W. Weston	2 00
Hunt Russet, Samuel Hartwell	3 00
Second, William H. Teele	2 00
Third, A. M. Knowlton	1 00
Lady's Sweet, David L. Fisk	2 00
Second, William H. Teele	1 00

Mackintosh, the second prize to Samuel Hartwell	$2 00
Maiden's Blush, Dr. Walter G. Kendall	2 00
Second, E. R. Cook	1 00
Mother, Asa Clement	3 00
Second, O. B. Hadwen	2 00
Third, Warren Fenno	1 00
Northern Spy, William T. Hall	3 00
Second, Samuel Hartwell	2 00
Third, O. B. Hadwen	1 00
Porter, John C. Hovey	3 00
Second, Samuel G. Damon	2 00
Third, C. M. Handley	1 00
Pound Sweet, George V. Fletcher	3 00
Pumpkin Sweet, Asa Clement	2 00
Second, George W. Stevens	1 00
Rhode Island Greening, Charles N. Brackett	4 00
Second, William O'Connell	3 00
Third, Artemas Frost	2 00
Roxbury Russet, E. R. Cook	4 00
Second, George Sanderson	3 00
Third, George V. Fletcher	2 00
Sutton, David L. Fisk	3 00
Second, O. B. Hadwen	2 00
Tolman Sweet, Artemas Frost	3 00
Second, Asa Clement	2 00
Third, Joshua T. Foster	1 00
Tompkins King, John Fletcher	3 00
Second, Samuel Hartwell	2 00
Third, William C. Eustis	1 00
Washington Royal, Charles N. Brackett	3 00
Second, O. B. Hadwen	2 00
Third, Samuel Hartwell	1 00
Washington Strawberry, Mrs. John S. True	2 00
Second, Warren Fenno	1 00
Any other variety, Edmund Hersey, Brewer	3 00
Second, William Everett, Jacobs Sweet	2 00
Third, Samuel Hartwell, Ben Davis	1 00
Crab Apples. — Hyslop, G. Blanchard	2 00
Second, Marshall W. Chadbourne	1 00
Any other variety, Benjamin P. Ware	2 00
Second, Nathan D. Harrington, Transcendent	1 00

Society's Prizes.

Pears. — Angouleme, Samuel G. Damon	4 00
Second, A. T. Brown	3 00
Third, Nathan D. Harrington	2 00

Bosc, Mrs. Mary Langmaid	$4 00
Second, John L. Bird	3 00
Third, Lewis E. R. Smith	2 00
Fourth, A. T. Brown	1 00
Clairgeau, Warren Fenno	3 00
Second, William S. Janvrin	2 00
Third, William T. Hall	1 00
Comice, Charles N. Brackett	3 00
Second, Warren Fenno	2 00
Third, S. F. & F. L. Weston	1 00
Dana's Hovey, George Frost	3 00
Second, Samuel G. Damon	2 00
Third, E. W. Wood	1 00
Diel, Thomas M. Davis	3 00
Second, E. L. Draper	2 00
Third, Benjamin G. Smith	1 00
Fulton, Elisha S. Converse	3 00
Second, S. F. & F. L. Weston	2 00
Third, Hon. James J. H. Gregory	1 00
Hardy, William Milman	3 00
Second, Rufus T. Tobey	2 00
Third, Aaron S. McIntosh	1 00
Howell, Mrs. Mary Langmaid	3 00
Second, Benjamin G. Smith	2 00
Third, Charles N. Brackett	1 00
Josephine of Malines, Warren Fenno	3 00
Second, John L. Bird	2 00
Third, David L. Fiske	1 00
Lawrence, William S. Janvrin	3 00
Second, Warren Fenno	2 00
Third, Thomas M. Davis	1 00
Louise Bonne of Jersey, John W. Martin	3 00
Second, Thomas M. Davis	2 00
Third, Leverett M. Chase	1 00
Marie Louise, Mrs. E. M. Lancaster	3 00
Second, Samuel G. Damon	2 00
Third, Charles E. Swain	1 00
Merriam, Aaron S. McIntosh	3 00
Second, Charles F. Curtis	2 00
Third, E. J. Hewins	1 00
Onondaga, Charles N. Brackett	3 00
Second, Thomas M. Davis	2 00
Third, Leverett M. Chase	1 00
Seckel, Nathan D. Harrington	4 00
Second, William Milman	3 00
Third, H. A. Stevens	2 00

Sheldon, Mrs. Mary Langmaid	$4 00
Second, Samuel G. Damon	3 00
Third, Warren Heustis & Son	2 00
Souvenir du Congrès, A. T. Brown	3 00
Second, G. W. Wilkinson	2 00
Third, Marshall W. Chadbourne	1 00
St. Michael Archangel, W. Heustis & Son	3 00
Second, Thomas M. Davis	2 00
Third, Benjamin G. Smith	1 00
Superfin, Leverett M. Chase	3 00
Second, J. M. W. Ober	2 00
Third, Thomas M. Davis	1 00
Urbaniste, Elisha S. Converse	3 00
Second, John L. Bird	2 00
Third, G. T. Raymond	1 00
Vicar, Mrs. E. M. Lancaster	3 00
Second, Elisha S. Converse	2 00
Third, Charles E. Swain	1 00
Winter Nelis, Thomas M. Davis	3 00
Second, Edwin A. Hall	2 00
Third, Winter Brothers	1 00
Any other variety, A. M. Leavitt, Belle Lucrative	3 00
Second, A. T. Brown, De Tongres	2 00
Third, Elisha S. Converse, Kingsessing	1 00
QUINCES.— Orange, Mrs. Mary T. Goddard	3 00
Second, A. T. Brown	2 00
Third, George V. Fletcher	1 00
Pear, " " "	3 00
Second, Benjamin G. Smith	2 00
Rea, George S. Harwood	3 00
Second, George S. Curtis	2 00
Third, Benjamin G. Smith	1 00
Any other variety, Charles S. Smith	3 00
Second, William S. Janvrin	2 00
Third, Benjamin G. Smith	1 00
PEACHES.— Crawford's Late, Samuel Hartwell	3 00
Second, Mrs. Mary Langmaid	2 00
Third, William H. Hunt	1 00
Any other variety, John L. Bird	3 00
Second, W. D. Hinds	2 00
Third, A. L. Whiton	1 00
PEACHES, ORCHARD HOUSE CULTURE.— Charles E. Grant	4 00
Second, L. L. White	3 00
PLUMS.— Coe's Golden Drop, Charles E. Grant	2 00
Any other variety, George V. Fletcher	2 00
Second, George V. Fletcher	1 00

NATIVE GRAPES.— Six bunches of Brighton, Samuel G. Damon	$3 00
Second, Samuel Hartwell	2 00
Third, Joseph S. Chase	1 00
Delaware, George B. Andrews	3 00
Second, Samuel G. Damon	2 00
Third, E. R. Cook	1 00
Herbert, Joseph S. Chase	3 00
Second, Samuel G. Damon	2 00
Iona, Samuel G. Damon	3 00
Second, Benjamin G. Smith	2 00
Lindley, F. J. Kinney	3 00
Second, Benjamin G. Smith	2 00
Third, Samuel G. Damon	1 00
Niagara, Samuel Hartwell	3 00
Second, Benjamin G. Smith	2 00
Third, P. G. Hanson	1 00
Pocklington, A. C. Osborn	3 00
Second, Samuel Hartwell	2 00
Third, George B. Andrews	1 00
Prentiss, Benjamin G. Smith	3 00
Second, Joseph S. Chase	2 00
Third, Mrs. Mary T. Goddard	1 00
Wilder, Benjamin G. Smith	3 00
Second, Samuel G. Damon	1 00
Third, George B. Andrews	1 00
Worden, " " "	3 00
Second, Benjamin G. Smith	2 00
Third, Samuel Hartwell	1 00
Any other variety, Benjamin G. Smith	3 00
Second, Benjamin G. Smith	2 00
Third, Luther Eames	1 00
Six bunches of Concord, from girdled vines, F. J. Kinney	3 00
FOREIGN GRAPES.—Four varieties, two bunches each, George A. Nickerson	10 00
Fourth prize to Benjamin G. Smith	4 00
Black Hamburg, two bunches, Mrs. J. W. Clark	5 00
Buckland Sweetwater, George A. Nickerson	5 00
Muscat of Alexandria, Joseph H. White	5 00
Wilmot's Hamburg, George A. Nickerson	5 00
Any other variety, Mrs. J. W. Clark	5 00
Second, Joseph H, White	4 00
CRANBERRIES.— Half-peck, L. J. Fosdick	3 00
Second, Edmund Hersey	2 00
Third, Rev. Calvin Terry	1 00
Gratuities:—	
Mrs. Mary T. Goddard, Apples and Pears	2 00
Warren Heustis & Son, Pears	2 00

Mrs. John S. True, Pears and Quinces	$1 00
American Manufacturing Co., Evaporator Exhibit	25 00

OCTOBER 14.

Gratuity :—

Charles H. Hovey, East Pasadena, Cal., Pomegranates	2 00

OCTOBER 28.

Gratuity :—

Nathan D. Harrington, Seckel Pears	1 00

NOVEMBER 18.

Special Prizes, Benjamin V. French Fund.

APPLES.—Baldwin, Samuel J. Trepess	5 00
Hubbardston, Artemas Frost	5 00

Society's Prizes.

Baldwin, William H. McIntosh	3 00
Second, Walter Russell	2 00
Third, Charles S. Smith	1 00
Danvers Sweet, Benjamin P. Ware	3 00
Fletcher Russet, John Fletcher	3 00
Second, William H. Teele	2 00
Hubbardston, Artemas Frost	3 00
Second, Marshall W. Chadbourne	2 00
Third, John Parker	1 00
Hunt Russet, Samuel Hartwell	3 00
Second, Hon. Starkes Whiton	2 00
Third, William H. Teele	1 00
Lady's Sweet, William H. Teele	3 00
Northern Spy, Ida E. Burbank	3 00
Second, Samuel Hartwell	2 00
Third, William T. Hall	1 00
Rhode Island Greening, Artemas Frost	3 00
Second, William O'Connell	2 00
Third, Charles N. Brackett	1 00
Roxbury Russet, Cephas H. Brackett	3 00
Second, Joshua Stowe	2 00
Third, Eustis Baker	1 00
Tolman Sweet, Artemas Frost	3 00
Second, Asa Clement	2 00
Third, Aaron S. McIntosh	1 00
Tompkins King, H. E. Small	3 00
Second, Asa Clement	2 00
Third, William C. Eustis	1 00
Any other variety, Artemas Frost, Gravenstein	3 00
Second, John Parker, Yellow Bellflower	2 00
Third, A. T. Brown, York Imperial	1 00

PEARS.—Angouleme, Samuel G. Damon	$4 00
Second, A. T. Brown	3 00
Anjou, A. T. Brown	4 00
Second, William Milman	3 00
Third, George V. Fletcher	2 00
Fourth, J. M. Swett	1 00
Clairgeau, William T. Hall	3 00
Second, Warren Fenno	2 00
Third, Samuel G. Damon	1 00
Comice, Warren Fenno	4 00
Second, Marshall W. Chadbourne	3 00
Dana's Hovey, Samuel G. Damon	4 00
Second, Edwin A. Hall	3 00
Third, Warren Fenno	2 00
Fourth, A. H. Lewis	1 00
Diel, Edwin A. Hall	3 00
Second, A. T. Brown	2 00
Third, Samuel G. Damon	1 00
Glout Morceau, Mrs. G. A. Curtis	3 00
Second, Edwin A. Hall	2 00
Third, A. H. Lewis	1 00
Josephine of Malines, Warren Fenno	3 00
Second, John L. Bird	2 00
Third, Samuel G. Damon	1 00
Langelier, A. T. Brown	3 00
Second, A. H. Lewis	2 00
Third, Aaron S. McIntosh	1 00
Lawrence, Samuel G. Damon	3 00
Second, Warren Fenno	2 00
Third, Leverett M. Chase	1 00
Vicar, Elisha S. Converse	3 00
Second, William H. McIntosh	2 00
Third, Charles E. Swain	3 00
Winter Nelis, Edwin A. Hall	3 00
Second, A. T. Brown	2 00
Any other variety, William Milman, Mount Vernon	3 00
Second, Samuel G. Damon, Sheldon	2 00
Third, S. F. & F. L. Weston, Columbia	1 00
FOREIGN GRAPES.—Two bunches of any variety, George A. Nickerson, Alicante	5 00
Second, George A. Nickerson, Lady Downes	4 00
Third, Joseph H. White, Alicante	3 00

Gratuities:

Thomas M. Davis, Collection of Pears	5 00
L. J. Fosdick, Cranberries	3 00
P. G. Hanson, "	2 00

APPLETON GOLD MEDAL.

Annual Exhibition of Plants and Flowers, September 6, 7. George McWilliam, Collection of Foreign Grapes.

SOCIETY'S SILVER MEDAL.

July 15. Amos Bates, Bates Gooseberries, a new Seedling.

SOCIETY'S BRONZE MEDAL.

Annual Exhibition of Plants and Flowers, September 6, 7. Charles H. Hovey, East Pasadena, Cal., Collection of Oranges and Lemons.

FIRST CLASS CERTIFICATE OF MERIT.

January 7. F. H. Frazier, Danville, Indiana, Arnold Pears.

HONORABLE MENTION.

February 4. Ellwanger & Barry, Rochester, N. Y., New Winter Pears.
July 1. James G. Allen, Yarmouth, Nova Scotia, Seedling Strawberries.

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1893.

By CHARLES N. BRACKETT, Chairman.

The exhibitions in this department the past year were more or less affected by the lateness of the season. This was especially the case for a few weeks during the earlier part of the summer, contributors finding it difficult to meet the requirements of the Schedule, with a season from ten days to two weeks behind the average.

This was in a great measure overcome, however, as the season advanced, and there was a corresponding improvement in our weekly exhibitions, which continued until the close of the season. In the arrangement of the Schedule, it is the aim of the Committee for Establishing Prizes to fix the dates for our shows to correspond with average seasons as nearly as possible. If a season is a week or ten days later than the average, which occasionally occurs, our exhibitions during the earlier part of such a season, and before warm, settled weather sets in, are sure to be more or less affected, as witnessed the past year.

There has been a noticeable improvement in our shows of Forced Vegetables during the months of January and February, both in the quantity and variety of specimens shown as compared with the previous year. Nearly all the prizes offered were competed for.

The show of vegetables at the May exhibition on the 6th of the month, brought out a fine display of the different varieties usually

seen at that season, most of which, however, were grown under glass. Although it was prize day for Asparagus, none was shown for premium until the Rhododendron Show, June 6. Last year the first Asparagus was exhibited May 10, and all the prizes were awarded. This leaves a wide margin between the two seasons as regards earliness, and accounts for the lack of exhibits on prize days earlier in the season.

At the Rose and Strawberry Show the display of vegetables was remarkably full and fine, all but two third prizes being awarded. An interesting feature of this exhibition, and one which attracted particular attention from the visiting public, was the large and well-grown collection of Lettuce, made by M. H. Walsh, gardener to Hon. Joseph S. Fay, consisting of eighteen named varieties. This exhibit afforded a favorable opportunity, such as is seldom offered, for comparing the different varieties, which those interested were quick to appreciate. The Appleton Silver Medal was awarded Mr. Fay for this fine display, and superior cultivation of lettuce.

The weekly exhibitions during the season, commencing on the first Saturday in July, have been good, and very few inferior specimens have been seen on our tables.

Owing to the lateness of the season, such vegetables as require a good degree of heat in order to bring them to maturity were in most instances found to be behind the requirements of the Schedule. Melons, Tomatoes, Egg Plants, Lima Beans, Sweet Corn, etc., were among the kinds which passed the first, and sometimes the second prize day, without a single specimen being shown. It was an unusually poor season for the Melon crop, and considerable complaint was also made by the growers, of great injury done to the vines by the black flea, or louse, and the rust. The first exhibit of Greenflesh Melons was made August 19, when Isaac E. Coburn showed some fine specimens. He was the only competitor, and the only person who showed Melons during the month.

The exhibition on September 16, was one of the largest and best of all the weekly shows. The various crops, which on account of the lateness of the season had previously lagged behind, seemed to have made up for lost time and to have fully caught up with the season and the Schedule. The quantity, quality, and variety of the specimens shown excited the admiration of visitors, and was

an agreeable surprise to your Committee. The specimen Melons, Cauliflowers, Celery, Tomatoes, Egg Plants, and Lima Beans, were excellent, showing both care and skill in cultivation, and would compare favorably with any former exhibition. Hon. Joseph S. Fay's collection of melons contained some fine specimens and attracted considerable attention, as did also Hon. Aaron Low's twenty-four well-grown varieties of tomatoes.

Judging from specimens shown, the past season must have been remarkably favorable for the growth of the Cauliflower. Finer flowers than those shown by William H. Teele and A. M. Knowlton, both at this and the Annual Exhibition, are rarely seen. These gentlemen have for several years taken the lead at our exhibitions as successful cultivators of this popular vegetable. They have, it is true, set the standard high; nevertheless it is hoped it will not discourage other growers from endeavoring to attain to, or even surpass it. There is still "room at the top."

On July 29, a new tomato was shown by Samuel J. Trepess, under the name of May's Favorite, which struck your Committee very favorably on account of the many points of excellence which it appeared to possess, aside from the uniformity and beauty of individual specimens. They were grown on the trellis system—without doubt the best manner of growing the finest and most perfect fruit. This method of culture may in a measure account for the unusual excellence of the specimens shown as compared with those of common field culture. For the amateur, or for the kitchen garden, when only a limited number of plants are required and space is an object, the trellis system has its advantages and can be recommended. It furnishes the most perfect fruit, requires less room, and places each fruit where it receives the full benefit of sun and air and is easily seen and gathered when required. The market gardener who grows by the acre could not with profit adopt this system on account of the expense attending it.

At the Annual Exhibition the Lower Hall was completely filled with the display of vegetables alone, forming the largest, and we think the best, exhibit this department has ever made.

The show of Celery, both for the Special and Regular prizes, was of a high order of merit, Warren Heustis & Son taking the first prize in both classes. The other principal exhibitors were Varnum Frost and H. R. Kinney. Appearance goes a great way in vegetables as well as fruits. The finest appearing of all

Celeries, the Golden Self Blanching and White Plume, are we think, the poorest in quality. When compared with the old Boston Market, they are not only tough and stringy, but lack the flavor and crispness characteristic of that famous old variety.

The potato exhibit at the Annual Exhibition was considerably larger in quantity than that of last year, and we think there was also an improvement in the quality of the specimens shown. The season seems to have favored the crop, which was of excellent quality and in this vicinity quite free from disease.

At the weekly shows Hon. Joseph S. Fay again took the lead and the prizes, and also was awarded the first premium for the best four varieties at the Annual Show. There has been a noticeable improvement within the past few years in the character of specimens offered for competition, which is quite encouraging, and that is the absence of coarse, overgrown, and sometimes unwashed specimens, which have occasionally in former years, been placed on exhibition, and which for the credit of our Society the Committee have felt called upon in the way of their duty, to remove and place under the table.

At the closing exhibition, November 18, this department was well represented and made a full and interesting display of the varied products of the season. Most of the premiums were competed for and awarded. Aside from the prize list, quite large miscellaneous collections were shown by H. R. Kinney, Walter Russell, Warren Heustis & Son, and Dr. Walter G. Kendall.

This brings us to the close of our exhibition season. And now we have harvested the hopes of a year ago and are thankful for the measure of plenty with which we are surrounded, let us plan for another seedtime and harvest, hoping to avoid past errors, to increase thrift, improve our exhibitions in all possible ways, and have a better balance sheet to show for the coming year than we now have for the past.

The annual appropriation for Vegetables was $1,100. Of this amount, the Committee have awarded in prizes and gratuities $1,044, leaving an unexpended balance of $56.

Respectfully submitted,

For the Committee,

C. N. BRACKETT,

Chairman.

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

January 7.

Radishes.— Four bunches, the third prize to John L. Bird	$1 00
Cucumbers.— Pair of any variety, Nathaniel T. Kidder	3 00
Second, John L. Gardner, Sion House	2 00
Third, " " "	1 00
Cauliflowers.— Four, William H. Teele	3 00
Second, Nathaniel T. Kidder	2 00
Lettuce.— Four heads, John L. Bird	3 00
Parsley.— Two quarts, George F. Stone	3 00
Second, F. J. Kinney	2 00
Third, H. A. Stearns	1 00
Mushrooms.— Twenty-four specimens, William Stobbart	3 00
Second, J. C. Rogers	2 00
Tomatoes.— Twelve specimens, Winter Brothers, Essex	3 00
Second, Winter Brothers, Lorillard	2 00
Third, William Stobbart	1 00
Gratuities : —	
Warren Heustis & Son, Celery	1 00
" " " " Dandelions	1 00

February 4.

Radishes.— Four bunches, George F. Stone	3 00
Cucumbers.— Pair, John L. Gardner	3 00
Dandelions.— Peck, Warren Heustis & Son	3 00
Mushrooms.— Twenty-four specimens, George E. Sanderson	3 00
Second, Isaac E. Coburn	2 00
Third, William Patterson	1 00
Rhubarb.— Twelve stalks, George Sanderson	3 00
Second, Elmer E. Sanderson	2 00
Tomatoes.— Twelve, Winter Brothers	3 00
Second, George M. Hay	2 00
Third, Elisha S. Converse	1 00
Gratuities : —	
Warren Heustis & Son, Parsley	1 00
George F. Stone, "	1 00
John L. Gardner, Celery and Cauliflowers	3 00
William Stobbart, Collection	2 00

MARCH 4.

Gratuities : —

George B. Gill, Mushrooms	$1 00
George F. Stone, Collection	2 00

SPRING EXHIBITION.

MARCH 21, 22, 23, AND 24.

William J. Walker Fund.

RADISHES.— Four bunches Turnip Rooted, George F. Stone	3 00
Second, Walter Russell, French Breakfast	2 00
Third, " " White Box	1 00
Four bunches of Long Scarlet, H. R. Kinney	3 00
CELERY.— Four roots, John L. Gardner	3 00
Second, Nathaniel T. Kidder	2 00
DANDELIONS.— Peck, Warren Heustis & Son	3 00
Second, Walter Russell	2 00
LETTUCE.— Four heads, George F. Stone	3 00
Second, H. R. Kinney	2 00
Third, John L. Gardner	1 00
WATER CRESSES.— Two quarts, Nathaniel T. Kidder	2 00
PARSLEY.— Two quarts, H. R. Kinney	2 00
Second, George F. Stone	1 00
RHUBARB.— Twelve stalks, George Sanderson	3 00
Second, Elmer E. Sanderson	2 00
TOMATOES.— Twelve, Elisha S. Converse	3 00
Second, Winter Brothers, Nicholson's Hybrid	2 00
Third, " " Essex	1 00

Gratuities : —

John L. Gardner, Cucumbers	2 00
Rev. Calvin Terry, Onions	1 00
Dr. Walter G. Kendall, Brussels Sprouts	1 00
Warren Heustis & Son, Collection	1 00

APRIL 1.

MUSHROOMS.— Twenty-four, Isaac E. Coburn	3 00

Gratuity : —

Walter Russell, Lettuce and Radishes	2 00

MAY EXHIBITION.

MAY 6.

William J. Walker Fund.

CUCUMBERS.— Pair, Warren Heustis & Son	3 00
Second, Walter Russell	2 00
Third, John L. Gardner	1 00

Spinach.— Peck, Warren Heustis & Son	$3 00
Dandelions.— Peck, Warren Heustis & Son	2 00
Second, Walter Russell	1 00
Lettuce.— Four heads, Walter Russell	3 00
Second, George F. Stone	2 00
Third, John L. Gardner	1 00
Gratuities : —	
Winter Brothers, three varieties of Tomatoes	2 00
William Nicholson, Tomatoes	1 00
Walter Russell, Radishes	1 00
George F. Stone, Radishes and Parsley	1 00
Francis Brown Hayes, Mushrooms	1 00

May 13.

Gratuities : —	
Francis Brown Hayes, Mushrooms	1 00
Charles E. Grant, Asparagus	1 00

May 27.

Gratuities : —	
Charles E. Grant, Asparagus	1 00
Sidney Lawrence, Rhubarb	1 00

June 3.

Gratuities : —	
Walter Russell, Radishes	1 00
Leonard W. Weston, Asparagus	1 00
Hon. George Heywood, "	1 00

RHODODENDRON SHOW.

June 6 and 7.

Carrots.— Twelve Short Scarlet, Nathaniel T. Kidder	3 00
Radishes.— Four bunches of Turnip Rooted, Walter Russell	3 00
Long Scarlet, Walter Russell	3 00
Asparagus.— Four bunches, C. W. Prescott	3 00
Second, William H. Hunt	2 00
Third, Leonard W. Weston	1 00
Cucumbers.— Pair, Warren Heustis & Son	3 00
Second, Walter Russell	2 00
Lettuce.— Four heads, Hon. Joseph S. Fay, Deacon	3 00
Second, Warren Heustis & Son, Boston Curled	2 00
Third, " " " " Tennisball	1 00
Rhubarb.— Twelve stalks, Samuel Trepess	3 00
Second, Francis Brown Hayes, Seedling	2 00
Third, " " " Victoria	1 00
Tomatoes.—Twelve, Winter Brothers, Nicholson's Hybrid	3 00
Second, Winter Brothers, Essex	2 00
Third, " " Chemin	1 00

Gratuities : —

Walter Russell, Onions and Spinach	$2 00
Hon. Joseph S. Fay, Cauliflowers	2 00
" " " " Lettuce	1 00
Warren Heustis & Son, Collection	2 00

JUNE 10.

Gratuity : —

Benjamin G. Smith, Rhubarb (16 lbs. 14 ozs.)	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 20 AND 21.

BEETS.— Twelve Summer Turnip Rooted, Warren Heustis & Son	3 00
Second, Crosby Brothers	2 00
Third, Mrs. Mary T. Goddard	1 00
ONIONS.— Twelve, Walter Russell, Portugal	3 00
Second, Warren Heustis & Son	2 00
Third, Walter Russell, Danvers	1 00
CUCUMBERS.— Pair of White Spine, Warren Heustis & Son	3 00
Second, Walter Russell	2 00
CABBAGES.— Three, Mrs. Mary T. Goddard	3 00
Second, Walter Russell	2 00
LETTUCE.— Four heads, Hon. Joseph S. Fay	3 00
Second, George F. Stone	2 00
Third, Walter Russell	1 00
PEAS.— Half-peck, Cephas H. Brackett	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, Charles E. Grant	1 00

Gratuities : —

Peter Fisher & Co., Collection of Tomatoes	2 00
Winter Brothers, Tomatoes	1 00
Mrs. Mary T. Goddard, Rhubarb	1 00
George Sanderson, "	1 00
Warren Heustis & Son, Collection	3 00
Walter Russell, "	3 00

Hon. Joseph S. Fay, Collection of eighteen varieties of Lettuce, Appleton Silver Medal.

EXHIBITIONS THROUGH THE SEASON.

JULY 1.

POTATOES. — Twelve specimens, Hon. Joseph S. Fay, Hebron	3 00
Second, Hon. Joseph S. Fay, Early Rose	2 00
Third, " " " " Queen	1 00

ONIONS.— Twelve specimens, Walter Russell	$2 00
Second, Hon. Joseph S. Fay	1 00
SQUASHES.— Long Warted, Warren Heustis & Son	2 00
CABBAGES.— Three, Walter Russell	3 00
Second, Hon. Joseph S. Fay, Wakefield	2 00
Third, " " " " Empress	1 00
PEAS.—Half-peck of American Wonder, Hon. Joseph S. Fay	3 00
Second, Charles E. Grant	2 00
Gratuities : —	
Nathaniel T. Kidder, Beans	1 00
Warren Heustis & Son, Collection	3 00
Walter Russell, "	3 00
Hon. Joseph S. Fay, "	2 00

JULY 8.

POTATOES.— Twelve specimens, Hon. Joseph S. Fay, Hebron	3 00
Second, Hon. Joseph S. Fay, Queen	2 00
Third, " " " " Rose	1 00
SQUASHES.— Four Long Warted, Walter Russell	2 00
Second, Warren Heustis & Son	1 00
BEANS.— Half-peck of String, Sumner Coolidge	3 00
Second, Warren Heustis & Son	2 00
PEAS.— Half-peck of Stratagem, Walter Russell	3 00
Any other variety, Charles E. Grant, Shropshire Hero	3 00
Second, Hon. Joseph S. Fay, Advancer	2 00
Third, " " " " American Wonder	1 00
Gratuities : —	
Dr. Walter G. Kendall, Lettuce	1 00
William Doran & Son, Collection of Lettuce	1 00
Winter Brothers, Tomatoes	1 00
Walter Russell, Collection	3 00
Warren Heustis & Son, Collection	2 00

JULY 15.

Levi Whitcomb Fund.

CABBAGES.— Three, Walter Russell	3 00
BEANS.— Half-peck of Cranberry, Sumner Coolidge	3 00
Second, Isaac E. Coburn	2 00
PEAS.— Half-peck, Charles E. Grant	3 00
Second, Isaac E. Coburn	2 00
Third, Rev. Calvin Terry	1 00
Gratuity : —	
Walter Russell, Collection	4 00

JULY 22.

POTATOES.— Twelve specimens, Hon. Joseph S. Fay, Hebron	$3 00
Second, Hon. Joseph S. Fay, Savoy	2 00
Third, " " " " Queen	1 00
LETTUCE.— Four heads, Walter Russell	3 00
Second, Warren Heustis & Son	2 00
Third, William Doran & Son	1 00
SWEET CORN.— Twelve ears, Sumner Coolidge	3 00
Third, Charles E. Grant	1 00
TOMATOES.— Open culture, twelve specimens, Varnum Frost, Emery	3 00
Second, Varnum Frost, Comrade	2 00
Third, Sumner Coolidge, Emery	1 00
Gratuities : —	
Charles N. Brackett, Telephone Peas	1 00
Rev. Calvin Terry, Advancer "	1 00
Nathaniel T. Kidder, Stratagem "	1 00
Charles E. Grant, Peas and Beans	1 00
Nathaniel T. Kidder, Tomatoes	1 00
E. W. Wood, "	1 00
Warren Heustis & Son, Collection	3 00
Walter Russell, "	3 00
Winter Brothers, "	2 00
Isaac E. Coburn, "	2 00
Dr. Walter G. Kendall, "	1 00

JULY 29.

POTATOES.—Twelve specimens, Hon. Joseph S. Fay, Hebron	3 00
Second, Hon. Joseph S. Fay, Savoy	2 00
Third, " " " " Rose	1 00
PEAS.— Half-peck, Sidney Lawrence, Stratagem	3 00
Second, H. R. Kinney, Stratagem	2 00
Third, Samuel J. Trepess	1 00
SWEET CORN.— Twelve ears of Crosby, F. J. Kinney	3 00
Any other variety, F. J. Kinney, Farquhar's First Crop	3 00
Second, Charles E. Grant, Corey	2 00
Third, " " " Burbank	1 00
TOMATOES.—Twelve specimens, Samuel J. Trepess, May's Favorite	3 00
Second, Varnum Frost, Comrade	2 00
Third, Isaac E. Coburn, Chenery	1 00
Gratuities :—	
Nathaniel T. Kidder, Duke of Albany Peas, and Corn	2 00
Charles N. Brackett, Peas	1 00
John Parker, Collection of Beans	2 00
Charles E. Grant, Beans	1 00
Samuel J. Trepess, Squashes	1 00
Charles W. Parker, Collection of Herbs	1 00

August 5.

Beans.— Two quarts of Goddard, Rev. Calvin Terry	$3 00
Half-peck of Horticultural, Isaac E. Coburn,	3 00
Tomatoes.— Twelve specimens of Emery, Varnum Frost	3 00
Any other variety, Samuel J. Trepess, President Cleveland,	3 00
Second, Varnum Frost, Comrade	2 00
Third, William C. Winter, Essex	1 00
Gratuities :—	
George M. Anderson, Cucumbers	1 00
Charles W. Parker, "	1 00
Charles E. Grant, Corn and Beans	2 00
Sidney Lawrence, Stratagem Peas	1 00
Warren Heustis & Son, Collection	3 00

August 12.

Sweet Corn.— Twelve ears, S. A. Merrill	3 00
Second, Hon. Aaron Low	2 00
Third, George M. Anderson	1 00
Egg Plant.— Four Round Purple, Walter Russell	2 00
Gratuities :—	
Rev. Calvin Terry, Beans	1 00
S. A. Merrill, Potatoes	1 00
Isaac E. Coburn, Collection	3 00
Warren Heustis & Son, Collection	2 00
Charles W. Parker, "	1 00
Charles E. Grant, "	1 00
Walter Russell, "	1 00

August 19.

Potatoes.— Twelve specimens, Hon. Joseph S. Fay, Hebron	3 00
Second, Hon. Joseph S. Fay, Queen	2 00
Third, " " " " Rose	1 00
Onions.— Twelve specimens, Hon. Joseph S. Fay, Danvers	3 00
Second, Varnum Frost, Danvers	2 00
Third, Hon. Joseph S. Fay, Red	1 00
Greenflesh Melons.— Four, Isaac E. Coburn	3 00
Celery.— Four roots, Warren Heustis & Son	3 00
Second, Varnum Frost	2 00
Beans.— Two quarts of Goddard, Isaac E. Coburn	3 00
Second, Rev. Calvin Terry	2 00
Sweet Corn.— Twelve ears of Potter's Excelsior, Hon. Joseph S. Fay	3 00
Second, Rev. Calvin Terry	2 00
Third, Charles N. Brackett	1 00

Any other variety, Oliver R. Robbins, Burr's	$3 00
Second, Hon. Aaron Low, Crosby	2 00
Third, Samuel Hartwell, "	1 00
PEPPERS.— Twelve Squash, George W. Jameson	3 00
Second, Nathaniel T. Kidder	2 00
Third, Walter Russell	1 00
Any other variety, Hon. Joseph S. Fay, Ruby King	3 00
Second, Water Russell, Bull Nose	2 00
Third, Hon. Joseph S. Fay, Bull Nose	1 00
Gratuities :—	
Samuel J. Trepess, Tomatoes	1 00
Walter Russell, Egg Plant	1 00
" " Collection	3 00
Warren Heustis & Son, Collection	2 00
Dr. Walter G. Kendall, "	1 00

AUGUST 26.

CABBAGES.— Three, Hon. Joseph S. Fay, Reynolds	3 00
Second, Hon. Joseph S. Fay, Warren	2 00
Third, " " " " Brunswick	1 00
CAULIFLOWERS.— Four, A. M. Knowlton	3 00
Second, William H. Teele	2 00
CELERY.— Four roots, Warren Heustis & Son	3 00
BEANS.— Two quarts of Large Lima, Varnum Frost	3 00
Dwarf Lima, Hon. Joseph S. Fay	3 00
MARTYNIAS.— Twelve, E. W. Jordan	2 00
Second, Walter Russell	1 00
PEPPERS.— Twelve Squash, P. G. Hanson	3 00
Second, Richard T. Lombard	2 00
Third, Hon. Joseph S. Fay	1 00
Any other variety, Richard T. Lombard, Bull Nose	3 00
Second, Walter Russell, Bull Nose	2 00
Third, Nathaniel T. Kidder, Ruby King	1 00
Gratuities :—	
Warren Heustis & Son, Celery	1 00
Rev. Calvin Terry, Beans	1 00
Charles E. Grant, Sweet Corn	1 00
Charles N. Brackett, Excelsior Sweet Corn	1 00
P. G. Hanson, Tomatoes	1 00
Walter Russell, Collection	3 00
Isaac E. Coburn, "	3 00

SEPTEMBER 16.

GREENFLESH MELONS.— Four, Samuel Hartwell	3 00
Second, Hon. Joseph S. Fay	2 00
Third, Sumner Coolidge	1 00

Salmon Flesh Melons.— Four, Hon. Aaron Low	$3 00
Second, Joseph S. Fay	2 00
Third, H. R. Kinney	1 00
Watermelons.— Pair, John Parker	3 00
Second, Rev. Calvin Terry	2 00
Third, Charles E. Grant	1 00
Cauliflowers.— Four, A. M. Knowlton	3 00
Second, William H. Teele	2 00
Lettuce.— Four heads, Walter Russell	3 00
Second, Warren Heustis & Son	2 00
Third, Hon. Joseph S. Fay	1 00
Celery.— Four roots, Warren Heustis & Son	3 00
Second, Varnum Frost	2 00
Third, H. R. Kinney	1 00
Parsley.— Two quarts, Mrs. Mary T. Goddard	2 00
Second, Walter Russell	1 00
Beans.—Two quarts of Large Lima, Varnum Frost	3 00
Second, Charles E. Grant	2 00
Corn.— Twelve ears of Potter's Excelsior, Charles N. Brackett	3 00
Second, Charles E. Grant	2 00
Third, Hon. Aaron Low	1 00
Any other variety, S. A. Merrill, Burr's	3 00
Second, William H. Hunt, "	2 00
Third, Marshall W. Chadbourne, Stowell's	1 00
Egg Plant.— Four, Sumner Coolidge	3 00
Second, H. R. Kinney	2 00
Third, Whittier & Co.	1 00
Tomatoes.— Three varieties, Varnum Frost	5 00
Second, Hon. Aaron Low	4 00
Acme, twelve specimens, Varnum Frost	3 00
Second, Hon. Aaron Low	2 00
Third, S. A. Merrill	1 00
Cardinal, Isaac E. Coburn	3 00
Second, Hon. Aaron Low	2 00
Emery, Warren Heustis & Son	3 00
Second, Hon. Aaron Low	2 00
Third, Varnum Frost	1 00
Paragon, " "	3 00
Second, Hon. Aaron Low	2 00
Any other variety, P. G. Hanson, Livingston's	3 00
Second, Hon. Aaron Low, Essex	2 00
Third, " " " Beauty	1 00
Peppers.— Twelve Squash, George W. Jameson	3 00
Second, P. G. Hanson	2 00
Third, Hon. Aaron Low	1 00
Any other variety, Hon. Aaron Low, Ruby King	3 00
Second, Hon. Joseph S. Fay, " "	2 00
Third, Richard T. Lombard, Bull Nose	1 00

Gratuities :—

Hon. Joseph S. Fay, Collection of Melons	$3 00
Hon. Aaron Low, Twenty-four varieties of Tomatoes	5 00
Nathaniel T. Kidder, Tomatoes	1 00
Charles E. Grant, Lima Beans	1 00
Walter Russell, Collection	4 00
Varnum Frost, "	3 00
P. G. Hanson, "	2 00
Richard T. Lombard, Collection	1 00

SEPTEMBER 23.

Gratuity :—

Ettore Tassinari, Danvers Onions	1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

OCTOBER 4 AND 5.

Special Prizes.

CAULIFLOWERS.— Best four specimens and best kept during the exhibition, A. M. Knowlton	5 00
Second, William H. Teele	4 00
CELERY.—Best four specimens and best kept during the exhibition, Warren Heustis & Son	8 00
Second, Varnum Frost	6 00

Regular Prizes.

BEETS.— Twelve Turnip Rooted, Varnum Frost	3 00
Second, Walter Russell	2 00
Third, H. R. Kinney	1 00
CARROTS.— Twelve Long Orange, H. R. Kinney	3 00
Second, Hon. Joseph S. Fay	2 00
Intermediate, Walter Russell	3 00
Second, H. R. Kinney	2 00
Third, Hon. Joseph S. Fay	1 00
PARSNIPS.— Twelve Long, Walter Russell	3 00
Second, H. R. Kinney	2 00
Third, Charles B. Lancaster	1 00
POTATOES.— Four varieties, Hon. Joseph S. Fay	5 00
Second, Mrs. Mary T. Goddard	4 00
Third, Charles B. Lancaster	3 00
Clark, Twelve specimens, E. C. Lewis	3 00
Second, Hon. Joseph S. Fay	2 00
Third, Mrs. Mary T. Goddard	1 00
Hebron, Charles S. Smith	3 00
Second, Hon. Joseph S. Fay	2 00
Third, Leonard W. Weston	1 00

Rose, Hon. Joseph S. Fay	$3 00
Second, Mrs. Mary T. Goddard	2 00
Third, F. J. Kinney	1 00
Savoy, Hon. Aaron Low	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, Hon. Joseph S. Fay	1 00
Any other variety, Mrs. Mary T. Goddard, Polaris	3 00
Second, Mrs. Mary T. Goddard, Downing	2 00
Third, Hon. Joseph S. Fay, Queen	1 00
Salsify.— Twelve specimens, Walter Russell	3 00
Turnips.— Twelve Flat, F. J. Kinney	2 00
Second, P. G. Hanson	1 00
Swedish, Hon. Joseph S. Fay	2 00
Second, E. C. Lewis	1 00
Onions.— Twelve Danvers, Ettore Tassinari	3 00
Second, Walter Russell	2 00
Third, Hon. James J. H. Gregory	1 00
Red, " " " "	3 00
Second, George F. Stone	2 00
Third, Hon. Joseph S. Fay	1 00
White, " " " "	3 00
Second, George F. Stone	2 00
Third, H. R. Kinney	1 00
Squashes.— Three Hubbard, Samuel Hartwell	3 00
Second, Walter Russell	2 00
Third, Charles B. Lancaster	1 00
Hybrid Turban, Hon. Aaron Low	3 00
Second, P. G. Hanson	2 00
Marblehead, P. G. Hanson	3 00
Second, Mrs. Mary T. Goddard	2 00
Marrow, Varnum Frost	3 00
Second, P. G. Hanson	2 00
Third, Walter Russell	1 00
Turban, P. G. Hanson	3 00
Brussels Sprouts.— Half-peck, Nathaniel T. Kidder	3 00
Cabbages.— Three Drumhead, Charles B. Lancaster	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, Ettore Tassinari	1 00
Red, Hon. Aaron Low	3 00
Second, Ettore Tassinari	2 00
Savoy, Charles B. Lancaster, Green Curled	3 00
Second, Mrs. Mary T. Goddard	2 00
Third, Charles B. Lancaster, Drumhead Savoy	1 00
Cauliflowers.— Four, William H. Teele	3 00
Second, Charles Morris	2 00
Third, A. M. Knowlton	1 00

CELERY.— Four roots of Paris Golden, Warren Heustis & Son	$5 00
Second, Varnum Frost	4 00
Third, H. R. Kinney	3 00
Any other variety, Warren Heustis & Son	5 00
Second, H. R. Kinney	4 00
ENDIVE.— Four specimens, F. J. Kinney	3 00
Second, H. R. Kinney	2 00
Third, Walter Russell	1 00
LETTUCE.— Four heads, Walter Russell	3 00
Second, Hon. Joseph S. Fay, Deacon	2 00
Third, " " " " Tennisball	1 00
PARSLEY.— Two quarts, Walter Russell	2 00
Second, Mrs. Mary T. Goddard	1 00
HORSERADISH.— Six roots, H. R. Kinney	3 00
Second, Walter Russell	2 00
CORN.— Yellow or Field, twenty-five ears, Mrs. Mary T. Goddard	3 00
Second, William H. Hunt	2 00
EGG PLANT.— Four Round Purple, H. R. Kinney	3 00
Second, Walter Russell	2 00
TOMATOES.— Three varieties, Isaac E. Coburn	5 00
Second, Samuel J. Trepess	4 00
Third, Hon. Aaron Low	3 00
Acme, Twelve specimens, Charles N. Brackett	3 00
Second, Hon. Aaron Low	2 00
Third, Charles E. Grant	1 00
Emery, Varnum Frost	3 00
Second, Hon. Aaron Low	2 00
Paragon, Artemas Frost	3 00
Second, P. G. Hanson	2 00
Third, Varnum Frost	1 00
Cardinal, Isaac E. Coburn	3 00
Second, P. G. Hanson	2 00
Third, Hon. Aaron Low	1 00
Any other variety, Isaac E. Coburn, Ignotum	3 00
Second, Artemas Frost, Stone	2 00
Third, Isaac E. Coburn, Chenery	1 00
PEPPERS.— Twelve Squash, George W. Jameson	3 00
Second, Hon. Aaron Low	2 00
Third, P. G. Hanson	1 00
Any other variety, Hon. Aaron Low, Ruby King	3 00
Second, Hon. Aaron Low, Bull Nose	2 00
Third, " " " Golden Queen	1 00

Gratuities: —

Charles N. Brackett, Sweet Corn	1 00
John Parker, Collection of Melons	2 00
Mrs. Mary T. Goddard, Collection of Beans	2 00

Hon. Joseph S. Fay, Collection	$6 00
P. G. Hanson, "	6 00
Walter Russell, "	6 00
Hon. Aaron Low, "	5 00
Warren Heustis & Son, "	4 00
H. R. Kinney, "	3 00
Hon. James J. H. Gregory, Collection	3 00
S. A. Merrill, "	2 00
Ettore Tassinari, "	2 00
Charles E. Grant, "	2 00

OCTOBER 14.

Gratuity :—

P. G. Hanson, Collection	2 00

NOVEMBER 11.

Gratuity :—

Charles A. Learned, Lettuce	1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 18.

CABBAGES.— Three Red, Hon. Aaron Low, Low's Mammoth	3 00
Second, Hon. Aaron Low, Buxton's Premium	2 00
Third, " " " Red Dutch	1 00
BRUSSELS SPROUTS.— Half-peck, Nathaniel T. Kidder	3 00
Second, George A. Nickerson	2 00
Third, Samuel J. Trepess	1 00
CAULIFLOWERS.— Four, William H. Teele	3 00
Second, A. M. Knowlton	2 00
Third, Samuel J. Trepess	1 00
CELERY.— Four roots, Warren Heustis & Son	3 00
Second, Varnum Frost	2 00
Third, H. R. Kinney	1 00
LETTUCE.— Four heads, H. R. Kinney	3 00
Second, Charles A. Learned	2 00
Third, Warren Heustis & Son	1 00
TOMATOES.— Twelve specimens, Winter Brothers, Early Essex	3 00
Second, Winter Brothers, Lorillard	2 00

Gratuities : —

P. G. Hanson, Turnips	1 00
Rev. Calvin Terry, Onions	1 00
Benjamin P. Ware, Kale	1 00
Charles E. Grant, Watermelons	1 00

H. A. Stevens, Mushrooms	$1 00
H. R. Kinney, Collection	5 00
Warren Heustis & Son, Collection	3 00
Walter Russell, "	3 00
Ettore Tassinari, "	2 00
Dr. Walter G. Kendall, "	2 00

APPLETON SILVER MEDAL.

Rose and Strawberry Exhibition, June 22. Hon. Joseph S. Fay, eighteen varieties of Lettuce and superior cultivation of the same.

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1893.

By JOHN G. BARKER, Chairman.

In presenting the report of our doings for another season we are glad to bring to your notice such facts as we trust will prove that there is continued interest in this department of our work. Were we to judge the interest by the competition for the various premiums there would be little reason for the continuance of the Committee; we have found it very difficult to arrange them so as to attract the attention of the various cultivators. The past season has been notable for few applications for the stated prizes, but we have been enabled to award gratuities, of which we do not doubt that you will approve, as just recognitions of superior skill in the various departments of horticultural productions.

Charles V. Whitten's Lily House, Dorchester.

The first visit of the season was on the 13th of March, to inspect a house of Lilies. Mr. Cotter, the gardener, informed us that the house contained 1,500 bulbs in 1,100 pots, 1,000 of the bulbs being *Lilium longiflorum*, and 500 *L. Harrisii*. Most of these were grown singly in six, seven, or eight-inch pots, according to the size of the bulbs. They were all potted early in October, and placed in cold frames, where they were given a thorough soaking of water; then a handful of sand was placed upon the surface of each pot, after which a covering of two inches of sifted ashes was placed over the whole, which keeps the pots from drying out. After this a sharp lookout was kept for the first appearance of growth in the lilies, when all the ashes was

removed and the plants were gradually exposed to the light. About the middle of November they began to take them into the greenhouses, where they filled the room previously occupied by the chrysanthemums, and where they were retarded or forced as required.

The excellence of these two varieties for forcing is acknowledged by all cultivators everywhere; on looking up the various authorities we find but one opinion. From a list of acknowledged authority lying before us we copy the statement in regard to *L. longiflorum*, that the flowers are large, long, and trumpet shaped, with spreading segments; dull white outside, but very pure white inside; fine for forcing. *L. Harrisii* (*L. longiflorum floribundum* or the Bermuda Easter Lily) is a splendid variety, differing from the type in being more floriferous, and producing larger flowers, of fine substance, averaging four to five inches in length, and well opened at the mouth; the flowers are pure white, and of most delicious fragrance. This variety is excellent for forcing.

This Lily House was certainly all that could be desired; the plants were healthy and luxuriant, and the array of flowers was, to say the very least, beautiful to behold.

In our last report your attention was called to the Rose Houses; you will be interested to know that what we then stated to you was fully sustained by their promising appearance at our later visit. The house of Brunners was particularly noticeable; the plants were imported in November, 1891, and were placed in this house in January, 1892; an abundant crop was cut from them the following April, after which they were allowed to make their summer growth. When the wood was well ripened they were pruned, and they were started into growth the second week in January, 1893, to produce the crop which we saw March 17. In every respect this house was a model of cleanliness; the growth and luxuriant bloom afforded the best evidence of the skill and care that had been bestowed upon them.

Estate of Nathaniel T. Kidder, Milton.

This is the second year that this estate has been in competition for the Hunnewell Triennial Premium. In our last report your attention was called in a general way to the estate, and at our second visit everything was found in good order. The exhibits at the hall by Mr. Kidder have added to the interest of the shows, as the productions have been during the last season, as in pre-

vious years, of unusual merit; this with the fact that in all departments of the garden and grounds, skill and careful cultivation were noticeable, made the Committee unanimous in their opinion that the estate is worthy of continued consideration for the premium for which it is entered.

W. W. Lee's Aquatic Garden, Northampton.

September 13th, the Committee enjoyed another visit to this exceptionally attractive place. Liberal premiums were offered for Aquatic Gardens, in the hope that a spirited competition might be awakened in this very interesting and growing department of ornamental gardening, but we were disappointed in this respect, Mr. Lee having made the only entry. We can add but little to what was said in our last report. That Mr. Lee is enthusiastic in his determination that the aquatic garden should take a front place in the ornamentation of pleasure grounds, is apparent from the improved condition of his own garden over that seen last year. In addition to the Lilies which he had last season in the heated pond, there were this year *Nymphæa Caroliniana*, *N. Laydekeri rosea*, and *N. Marliacea albida*.

On the slope of a bank at the edge of a new pond which is being made exclusively for hardy Lilies, there have been planted over seven hundred Ferns. In that pond there were growing:

Nymphæa cœrulea.	*Nymphæa odorata gigantea.*
" *gracilis.*	*Nelumbium speciosum.*
" *Marliacea carnea.*	

The complete list of Nymphæas grown by Mr. Lee this season comprises twenty species and varieties, as follows,— though of some there are two or three plants.

Nymphæa albida candidissima.	*Nymphæa Marliacea chromatella.*
" *cœrulea.*	" " *rosea.*
" *Caroliniana.*	" *odorata gigantea.*
" *dentata.*	" " *rosea.*
" *Devoniensis.*	" " *sulphurea.*
" *gigantea.*	" *rubra.*
" *gracilis.*	" *Sturtevanti.*
" *Laydekeri rosea.*	" *tuberosa.*
" *Marliacea albida.*	" *Zanzibarensis.*
" " *carnea.*	" " *rosea.*

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST.

In connection with the visit to Mr. Lee's, a very pleasant and profitable afternoon was spent at the Agricultural College, under the guidance of Professor Maynard. The working of the horticultural department was explained to us by him, and that of the Agricultural by Professor Brooks, whose statements will be read with more than usual interest. This was the first time that an opportunity had been offered to visit the college grounds, and as the Society has a representation on its Board of Control, it is fitting that our members should know something of the working of this highly successful and well managed institution. The time was when it was looked upon as an expensive, unpractical luxury, its friends were few, and success seemed next to an impossibility; but time and the practical results of the persistent labors of the President and the Professors have changed public opinion from the point of prejudice to that of hearty coöperation, and the institution is now receiving—not too much by any means—the encouragement it so justly merits. Not more than one of your Committee had any idea of what had been, and is now being, accomplished by the institution, in sending out practical young men, thoroughly fitted to take up the different branches there taught, and practise them successfully in life. No mere theorists leave the institution — work they must — and the State and country are richer for it. We regret not being able to see President Goodell more than long enough to receive his hearty welcome, important engagements demanding his time; but we are more than glad to bring to you such good reports of the work of the College from the Professors already alluded to, and we ask for them your careful consideration of the same, and as far as possible your hearty and zealous coöperation by encouraging and advancing the good work that is being done there.

The following is Professor Maynard's statement:

Report of the Botanical Department of the Massachusetts Agricultural College, Amherst, November 1, 1893. By Professor S. T. Maynard.

The Botanical Department of the Massachusetts Agricultural College has under its management about seventy-five acres of land, divided nearly as follows: Apple orchard, 4 acres; Pear

orchard, 2 acres; Peach orchard, 4 acres; Cherry orchard, 1 acre; Plum orchard, 1 acre; Quince orchard, 1 acre; Grapes, 2 acres; Raspberries and Blackberries, 2 acres; Currants, ½ acre; Strawberries, 1 acre; Market Gardening Crops, 8 acres; Nursery, 2 acres; Lawn, ornamental grounds, roads, and walks, 15 acres; mowing land, grove and forest plantation, 30½ acres.

In all the fruit plantations the principal aim has been to grow a few trees only of all of the varieties of the most value in any locality, so that the products of this large area are not as profitable as would have been the case if fewer kinds had been planted.

In the market garden, small areas of all the leading kinds of vegetables are grown, in the most approved way, and the products are sold in the local markets, thus illustrating the methods of growing and marketing such crops.

The vineyards consist of two parts; the old vineyard devoted to growing commercial varieties, and the new vineyard, where all the new varieties are grown and tested.

The Old Vineyard.— The vines were set in this vineyard in 1869 — partly rooted vines, and the balance long cuttings planted three or four in a place, at the proper distance for permanent growth, which at that time was considered to be six by eight feet. The soil is a coarse sandy loam, mixed with an abundance of stones from the size of peas to a foot in diameter, and underlaid, at a varying depth of from two to four feet, with a hardpan subsoil.

The slope is directly to the south, and the vines are protected by a permanent grove on the north, a planted grove of larch and Scotch and Austrian pines on the west, and scattered trees in a grove on the south. At planting the land was manured with stable manure, and a crop of potatoes was grown between the rows the first season.

Heavy chestnut posts were set the second year after planting, with four wires of No. 14 galvanized iron, one foot apart, for the vines to run upon. The first wire is placed two and a half feet from the ground.

During the first fifteen years of its history, the vines were trained in a natural fan system, upon the trellis, and pruned on the spur system, *i. e.* all laterals coming out on the radiating arms were cut back after fruiting, to two buds. The vines are now trained on the one cane renewal system, *i. e.* one large cane is

grown each year along one of the lower wires, which is to produce the fruit the following season, while the fruiting cane, which is carried on the top wire during the season, is cut away, leaving only one or two buds from which a new cane must be grown to replace the successive fruiting canes.

The work of planting, cultivating, and pruning has largely been done by students, each member of the junior class being obliged to work long enough on the vines to master the systems of training and pruning.

It was in this vineyard that the first systematic experiments in girdling the vine were made in a commercial way, and here it was first proven that grapes from girdled vines contain a larger percentage of sugar than those grown on ungirdled vines, and that by this process many varieties which would not otherwise ripen in Massachusetts can be successfully grown. In this vineyard there are grown about twenty varieties, but the vines are principally Concords.

The New Vineyard.— The soil in which these vines are planted is a light sandy loam with a western exposure. Two vines of each variety are planted together, the vineyard including about a hundred and twenty-five varieties, over one hundred of which fruited the past season. The vines are trained to two wires, the fruiting cane being carried on the top wire, and the new cane for the next year's fruiting being grown on the lower wire.

One vine of the two of each variety, is used to test the value of insecticides and fungicides, the other being left untreated for the purpose of proving results.

In this vineyard records are made of the hardiness and vigor of the vines of the different varieties, and the time of blooming and of ripening the fruit. The fruit is gathered as nearly as possible when perfectly ripe, and placed in the cold storage room, where the keeping qualities of each variety are tested.

The results of all of the above mentioned trials are reported in the bulletins of the Hatch Experiment Station, as are also all experiments made in testing the qualities of all new varieties of other fruits.

Each variety is distinctly labelled with a large sheet-iron label placed in front of the first vine, so that every one may study the characteristics of each.

All new varieties reported as promising, are obtained as soon as possible after introduction; many from the originators, before

they are put upon the market, and careful comparison is made with older varieties, to determine their value for growth in New England.

The great want of our grape growers is a variety that will ripen so early as to escape early frosts. It is found that out of the large number of new varieties tested there are very few which are even as early as the Concord, and at the same time possess all the good qualities of that variety. A new variety must be earlier, equally hardy and productive, and of better quality, to be of any value to us, and unless they possess these superior characteristics should never be introduced.

A few of the recent introductions, however, have shown much promise, and if they continue to behave as well here, and in other localities, as they have in the past, will be valuable additions to our list. The two that show the most decided merit are the Winchell (Green Mountain) and Peabody.

The Winchell is a green grape of medium size of berry and bunch, of thoroughly good quality, and ripens with, or a little before, Moore's Early. The vine is vigorous, hardy, and productive, and the fruit is a good keeper, adhering to the stem for a long time after picking. Its color may be objectionable for market, but it certainly is valuable for home use.

The Peabody is a black grape, of larger size of bunch and berry than the Winchell, ripening with the latter. In quality it would not be called a sweet grape, but the pulp is tender, separating easily from the seeds, and of a pleasant, vinous quality. The foliage is like that of the Clinton, and other varieties of *cordifolia* origin, of a very firm texture and resistant to mildew. The keeping qualities of the Peabody have not been fully tested, but the indications are that it will prove a long keeper.

In view of our experiments we would recommend for general planting for home use and market, the following:

Black, Worden, Moore's Early, Concord, and Peabody.

Red, Brighton and Delaware.

White, Winchell, Lady, and Pocklington.

The land in both vineyards is kept thoroughly cultivated, especially in dry, hot weather, when the cultivator is run at least once each week, to keep the ground loose and free to prevent the rapid evaporation of the moisture.

The fertilizers used have been varied according to the previous growth of the vine. If the vines made but a small growth one

season, we have used in the next some stable manure; but the standing formula is 1,500 pounds of fine ground bone, and 500 pounds of muriate or sulphate of potash. With a good ordinary growth and medium crop of grapes this might be reduced to 1,000 pounds of fine bone and 300 of potash. This formula is recommended for all fruits in general.

SELECT LISTS.—The varieties of fruits our experience would lead us to suggest as best for home use and market are as follows:

Apples.— Red Astrachan, Oldenburg, Sweet Bough, Gravenstein, Fall Pippin, Hubbardston, Rhode Island Greening, Baldwin, Roxbury Russet.

Pears.— Margaret, Giffard, Clapp's Favorite, Bartlett, Sheldon, Bosc, Seckel, Anjou, Lawrence, Dana's Hovey.

Peaches.— Amsden's June, Rivers, Mountain Rose, Oldmixon, Crawford's Early, Crawford's Late, Reeves's Favorite, Crosby, Stump the World.

Plums.— Green Gage, Imperial Gage, Bradshaw, McLaughlin, Lombard, Abundance.

Cherries.— Napoleon, Gov. Wood, Early Richmond, Black Tartarian, Windsor, Downer.

Currants.— Fay, Cherry, Versaillaise, White Grape, Lee.

Blackberries.— Agawam, Snyder, Taylor.

Black-cap Raspberries.— Souhegan, Ohio, Hilborn, Kansas.

Red Raspberries.— Hansell, Thompson's Pride, Thompson's Early Prolific, Marlboro, Cuthbert, Golden Queen.

Strawberries.— Beder Wood, Haverland, Bubach No. 5, Beverly, Parker Earle.

GREEN HOUSES.— The glass structures consist of

One	large octagon,	40 x 40 feet	x 28 feet	high,
"	" "	40 x 40 feet	x 20 "	"
"	rose room, 22 x 25 feet,			
"	dry stove or cactus room, 25 x 25 feet.			
"	moist stove or lily	"	22 x 25	"
"	stove	"	25 x 25	"
"	propagating	"	24 x 53	"
Two	"	"	37 x 18	"
"	carnation	"	37 x 18	"
One	vegetable	"	36 x 42	"
"	cold grapery		18 x 25	"
"	cool pit,		15 x 28	"

In the large houses are grown specimen plants of economic or educational value, while in the smaller houses are grown all kinds of bedding and flowering plants for the decoration of the grounds or for sale. In these houses numerous experiments are being made in the destruction of insects, and the prevention of fungous diseases attacking greenhouse plants.

In the construction of the houses, it has been the aim to introduce as many methods as possible of building, glazing, ventilating, and heating, that the students may know what is best in every line of greenhouse work.

On the grounds about the greenhouses and other buildings the lawn is kept closely mown, and trees, shrubs, and flowering plants are planted in large groups and masses, more than twenty-five thousand bedding plants having been set out on the college grounds during the past season.

AMHERST, Mass., Dec. 9, 1893.

My Dear Mr. Barker:—I send you today in another cover the list of varieties of fruits grown on our grounds. Many of them are young and have produced no fruit but are growing well and will serve soon to give us the needed information as to their value for New England.

It is our purpose to obtain every new variety of promise as soon as it is obtainable, and we would especially request all originators to send us specimens of any new and promising varieties of fruits, flowers, or vegetables.

When sent in this way we are under obligation to use our utmost vigilance that none of the stock shall become disseminated, and will report at the earliest possible date as to their value. We cannot, however, expect finally to determine the value of a variety until it has fruited several successive years.

Very truly yours,

S. T. MAYNARD.

APPLES.

Alexander,
Arabskoe,
Arkansas Beauty,
Arkansas Black,
Atkins's Red,
Baldwin,
Beauty of Kent,
Ben Davis,
Benoni,
Blue Annis,

Brilliant,
Carlough,
Catherine,
Cheeseborough Russet,
Chenango,
Chicago,
Crawford,
Delaware Winter,
Early Coltar,
Early Harvest,
Early Pennock,
English Codlin.
Fallawater,
Fall Orange,
Fall Pippin,
Fameuse,
Fanny,
Gano,
Garden Royal,
Gaus,
Gen. Lyon,
Gillyflower,
Golden Sweet,
Gravenstein,
Haas,
Hibernial,
Hubbardston,
Hurlbut,
Hyslop (Crab),
Indian Scion,
Jacobs Sweet,
Jeffries,
Jonathan,
Keswick Codlin,
Kinnard,
Lady,
Lady's Sweet,
Lankford,
Late Astrachan,
Leicester Sweet,
Lord's,
Maiden's Blush,
Mammoth Black Tug,
Mammoth Pippin,
Mann,
Marengo (Crab),
Marshall,
Minkler,
Minnesota Winter,
Monmouth,
Mother,
Northern Spy,
Oldenburg,
Ord Benie,
Orion,
Paragon,
Peck's Pleasant,
Pewaukee,
Pomme Royal,
Porter,
Primate,
Rambo,
Red Astrachan,
Red Bietigheimer,
Red Russet,
Roxbury Russet,
Salome,
Scarlet Cranberry,
Shiawassee,
Smokehouse,
Sops of Wine,
Stark,
Strawberry,
Stump,
Summer Pippin,
Summer Rose,
Sutton Beauty,
Swaar,
Sweet Bough,
Switzer,

Tetofsky,
Titovka,
Tompkins King,
Transcendent (Crab),
Vandevere,
Wagener,
Washington Royal,
Wealthy,
Westfield Seek-no-further,
White Russet,
Williams,
Winesap,
Winter Banana,
Yellow Bellflower,
Yellow Transparent,
Yellow Siberian (Crab).

PEACHES.

Alexander,
Amsden's June,
Chair's Choice,
Chapman,
Conklin,
Coolidge Favorite,
Crawford's Early,
Crawford's Late,
Crosby,
Elberta,
Ellison,
Foster,
Globe,
Hale,
Holland,
Hyatt,
Japan No. 7,
Japan No. 9,
Japan No. 10,
Lady Ingold,
Lovett's White,
Morris's White,
Mountain Rose,
New Prolific,
Oldmixon Free,
Red Cheek Melocoton,
Reeves's Favorite,
Rivers,
Russian,
Schumaker,
Seedlings of Crosby,
" from Japan,
" of Wager,
Stump the World,
Tong Pa,
Towne,
Wager,
Waterloo,
Wheatland,
Wonderful.

PEARS.

Angouleme,
Anjou,
Ansault,
Bartlett,
Belle Lucrative,
Bessemianka,
Bosc,
Boussock,
Buffum,
Clapp's Favorite,
Clairgeau,
Columbia,
Dana's Hovey,
Directeur Alphand,

Duhamel du Monceau,
Early Harvest,
Easter Beurre,
Flemish Beauty,
Frederick Clapp,
Garber,
Giffard,
Hoosic,
Howell,
Idaho,
Japan Golden Russet,
Jones,
Josephine of Malines,
Keiffer,
Krull,
Lady Duke,
Lawrence,
Lawson,
Le Conte,
Lincoln Coreless,
Louise Bonne of Jersey,
Marshall,
Merriam,
Mount Vernon,
Mystic,
Osband's Summer,
P. Barry,
Pratt,
President Clark,
President Mas,
Reeder,
Rostiezer,
Seckel,
Seneca,
Sheldon,
Souvenir du Congrès,
Student,
Superfin,
Tyson,
Vicar,
Volga (Wild Pear),
Wayland,
White Doyenne,
Wilder,
Winter Nelis.

GOOSEBERRIES.

Champion,
Columbus,
Crown Bob,
Downing,
Golden Prolific,
Houghton,
Industry,
Lancashire Lad,
Pale Red,
Red Jacket,
Roosch,
Smith,
Triumph,
Whitesmith.

CURRANTS.

Black Champion,
Black Naples,
Cherry,
Common Black,
Crandall,
Fay,
Greenfield,
Knight's Improved,
Lee,
London Red,
Moore's Selected,
North Star,

Prince Albert,
Red Dutch,
Seedlings,
Versaillaise,
Victoria,
White Dutch,
White Grape.

PLUMS.

Abundance,
Bavay,
Botan,
Botankio No. 1,
Botankio No. 2,
Bradshaw,
Brunswick,
Bryanstone,
Burbank,
Chabot,
Clyman,
Coe's Golden Drop,
Czar,
Damson,
Decaisne,
De Soto,
Duane's Purple,
Early Green Gage,
Excelsior,
Flower,
French Damson,
Garfield,
Gen. Hand,
German Prune,
Green Gage,
Guii,
Hawkeye,
Hortense,
Hottankio No. 1,
Hottankio No. 2,
Huling,
Illinois Iron Clad,
Imperial Gage,
Italian Prune,
Jefferson,
Kingston,
Lawrence,
Lincoln,
Lombard,
Lucombe's Nonesuch,
Manitoba Red,
Marie,
Massu,
McLaughlin,
Missouri Green Gage,
Monroe,
Moore's Arctic,
Niagara,
Ogon,
Oullin's Golden,
Orange,
Peter's Yellow Gage,
Pond's Seedling,
Pottawattamie,
Prince Englebert,
Prune d'Agen,
Prune French Petite,
Puritan,
Quackenboss,
Red June,
Saratoga,
Satsuma Blood,
Shipper's Pride,
Shira tra Beni,
Simoni,
Smith's Orleans,

Spaulding,
Stanton,
Tragedy,
Ura Beni,
Washington,
Weaver,
Wild Goose,
Wolf,
World Beater,
Yellow Egg,
Yocobe.

Apricots.

Acme,
Alexis,
Bengoume,
Early Moorpark,
Gibbs,
Gold Dust,
Hubbard,
Montgamet,
Moorpark,
Peach,
Purple,
Russian.

Nectarines.

Downton,
Goliath.

Cherries.

Belle Magnifique,
Black Heart,
Black Tartarian,
California Advance,
Centennial,
Choisy,
Coe's Transparent,
Downer,
Dyehouse,
Early Purple,
Elton,
Empress Eugenie,
Gov. Wood,
Large Montmorency,
Late Richmond,
Louis Philippe,
Mezel,
Montmorency Ordinaire,
Napoleon,
Olivet,
Ostheim,
Rockport Bigarreau,
Royal Duke,
Suda Hardy,
Windsor,
Wragg.

Quinces.

Champion,
Columbia,
Meech's Prolific,
Orange,
Rea,
Seedlings.

Grapes.

Agawam (Rogers No. 15),
Amber,
Amber Queen,
Antoinette,
Armenia (Rogers No. 39),
Arnold's No. 1,
" " 2,
" " 16,
Augusta,
August Giant,
Bacchus,
Barry (Rogers No. 43),
Beauty,
Belinda,
Berckmans,
Bertha,
Black Eagle,
Brighton,
Brilliant,
Catawba,
Caywood's No. 50,
Centennial,
Champion,
Charter Oak,
Clinton,
Colerain,
Concord,
Concord Muscat,
Cottage,
Creveling,
Cynthiana,
Delaware,
Delaware Muscat,
Diana,
Early Ohio,
Early Victor,
Eaton,
El Dorado,
Elsinburgh,
Elvira,
Emma,
Empire State,
Essex (Rogers No. 41),
Esther,
Etta,
Excelsior,
Faith,
Geneva,
Goethe (Rogers No. 1),
Golden Drop,
Golden Gem,
Grein's Golden,
" No. 2,
G. W. Campbell.
Hartford,
Hayes,
Herbert (Rogers No. 44),
Herman Jaeger,
Highland,
Howard's Seedlings,
Ideal,
Illinois City,
Iona,
Isabella,
Janesville,
Jefferson,
Jessica,
Jewell,
Lady,
Lady Washington,
Lee's Prolific,
Lindley (Rogers No. 9),
Maria Louisa,
Martha,
Massasoit (Rogers No. 3),
Merrimac (Rogers) No. 19,
Mills,
Montefiore,
Moore's Diamond,
Moyer,

Nectar,
Niagara,
Norfolk,
Norman,
Northern Muscat,
Norton,
Oneida,
Oriental,
Peabody,
Pearl,
Perkins,
Pizarro,
Pocklington,
Poughkeepsie Red,
Prentiss,
Rebecca,
Requa (Rogers No. 28),
Rochester,
Rockwood,
Rogers No. 30,
" " 32,
" " 33,
" " 34,
Rommel,
Salem (Rogers No. 53),
Secretary,
Seedling No. 5,
" " 7,
" " 9,
Seedling No. 10,
" " 15,
" " 18,
" " 19,
" " 42,
" " 44,
Standard,
Stayman's No. 3,
" " 4,
" " 42,
" " 44,
" " 47,
Telegraph,
Transparent,
Triumph,
Ulster Prolific,
Union Village,
Vergennes,
Victoria,
Vitis Arizonica,
" Californica,
" cordifolia,
" Mexicana,
Walter,
Wilder (Rogers No. 4),
Wilding,
Woodruff Red,
Worden,
Wyoming Red.

BLACKBERRIES.

Agawam,
Crystal White,
Early King,
Erie,
Fred,
Hoosier,
Lovett's Best,
Lucretia,
Minnewaski,
Ohmer,
Snyder,
Stone,
Taylor,
Topsy,
Wachusett,
Western Triumph,
Wilson,
Woodford.

Red Raspberries.

Brandywine,
Champion,
Crimson Beauty,
Cuthbert,
Fontenay,
Gladstone,
Golden Queen,
Hansell,
Herstine,
Highland Hardy,
King,
Marlboro,
Naomi,
Rancocas,
Scarlet Gem,
Stayman's No. 5,
Superb,
Superlative,
Thompson's Early Prolific,
Thompson's Pride,
Victor,
White Mountain.

Black-cap Raspberries.

Ada,
Brackett's Seedling,
Carman,
Cluster,
Corinth,
Crawford,
Cromwell,
Earhart,
Eureka,
Hilborn,
Howard's Seedling,
Kansas,
Lovett,
Nemaha,
Ohio,
Older,
Palmer,
Progress,
Smith's Prolific,
Souhegan,
Springfield,
Wade,
Winona.

Strawberries.

Accomack,
Alabama,
America,
Auburn,
Barton's Eclipse,
Beaver's No. 3,
Beder Wood,
Beebe,
Belle la Crosse,
Belmont,
Beverly,
Boynton,
Brandywine,
Bubach No. 5,
Chairs,
Charles Downing,
Charlie,
Childes,
Cornelia,
Crawford,
Crawford's No. 51,
Crescent,

Cumberland,
Cutter's Seedling,
Cyclone,
Davis No. 2.
Dayton,
Dew,
Dutton,
Edgar Queen,
Edith,
Epping (*Synonym* Yankee Doodle),
E. P. Roe,
Equinox,
Eureka,
Felton,
Florence,
Gandy,
Gen. Putnam,
Gillespie,
Glendale,
Golden Defiance,
Gov. Hoard,
Greenville,
Haverland,
Hinsmore,
Howard's No. 10,
" " 13,
" " 20,
" " 28,
" " 34,
" " 39,
" " 41,
" " 53,
" " 76,
" " 116,
" " 117,
" " 122,
" " 145,
" " 149,
" " 157,
Howard's No. 250,
" " 300,
" " 501,
" " 601,
" " 605,
Jay Gould,
Jewell,
Jucunda,
Lady Rusk,
Laxton's Captain,
" Commander,
" Noble.
Leader,
Lennig's White,
London,
Lovett's Early,
Luther,
Marshall,
Martha,
Michell's Early,
Meek's Early,
Middlefield,
Miller's Seedling,
Miner,
Moore,
Mount Holyoke,
Mrs. Cleveland,
Muskingum,
Norwood,
Ohio Centennial,
Oliver,
Oregon,
Our Choice,
Pacific,
Parker Earle,
Parmenter's Seedling,
Phillip's "
Pioneer,
Pomona,
Princess,

Princeton Chief,
Regina,
Riehl's No. 1,
Richmond,
Rio,
Sadie,
Sandoval,
Saunders,
Seedling No. 24,
" " 34,
" " 35,
" " 40,
" " 41,
" " 42,
" " 44,
" " 45,
" " 46,
" " 47,
" " 48,
" " 49,
" " X,
" " XX,
Sharpless,
Shaw,
Shuckless,
Shurtleff's Seedling,
Shuster's Gem,
Smeltzer's Early No. 2,
Southard,
Standard,
Stayman's No. 1,
Sterling,
Stevens,
Sunnyside,
Swindle,
Tennessee,
Thomson's No. 66,
Timbrel,
Townsend's No. 20,
Triomphe de Gand,
Van Deman,
Waldron,
Walton,
Warfield,
Warren,
Westbrook,
West Lawn,
Williams,
Wilson,
Woolverton,
Yale.

Professor Brooks's Statement.

Amherst, Mass., February 15, 1894.

Mr. John G. Barker, Jamaica Plain:

Dear Sir: — I send you herewith a statement concerning our field of potatoes, as requested. I should have sent this earlier had it not been for the fact that our crop, which was put into pits, had not all been sorted or exactly measured. It was measured in baskets (bushel and two-bushel) as picked up. We have been sorting and measuring more exactly as we have had opportunity to sell, and I have hoped to finish before the report would be needed, so that I might be more exact. The tubers run large and of fine

quality, being very smooth and even. I feel sure the crop has not been overestimated or overvalued. The sale is rather slow and will not probably be completed for some time yet. I therefore send the report now, with regrets that I cannot be more precise.

Truly yours,

WM. P. BROOKS.

POTATOES.

Area, 12.21 acres. Soil, medium loam, well drained and warm.

History of the Field.— Previous to the fall of 1890, it had been pastured for five or six years; it was ploughed late in the fall of 1890, and in the following spring harrowed and planted to potatoes, fertilizers only being used. It was ploughed in the fall of 1891 and five acres sown to rye; which was mostly cut for fodder, and followed by squashes in 1892. On the balance of the field, in 1892, we had two acres of soya beans, on manure and fertilizer; two acres of Japanese millet, and three acres of mangolds, all receiving both manure and fertilizers in moderate amounts.

Management of the Crop of Potatoes.— The entire field was ploughed in the fall of 1892, and during the winter it was manured at the rate of four cords per acre of strong manure, made by milch cows, and spread as drawn from the cellar.

The land was lightly reploughed in the spring of 1893, and the following fertilizers were applied per acre:

Nitrate of soda, 125 pounds; plain superphosphate, 400 pounds; South Carolina rock phosphate, 300 pounds; bone meal, 100 pounds; and high grade sulphate of potash, 300 pounds.

These fertilizers were mixed just before use, and were put on broadcast with the Acme fertilizer distributor, and harrowed in. The seed was Beauty of Hebron, of our own raising, but from stock imported from Maine in 1891. Medium to large tubers, cut into three or four pieces by hand, were planted. The work was done with the Aspinwall potato planter, the rows being three feet and four inches apart, and the pieces were about sixteen inches apart in the row. The field was rolled after planting. It was harrowed once just before the plants came up, and again when they were very small. Later they were cultivated with the Syracuse cultivator twice, and finally were slightly ridged with Prout's horse hoe. Little hand work was done, but six men walked

through the field with hoes when the crop was about half grown, cutting out weeds that were left by the cultivator, spending one day at the work. Later, after the crop covered the ground, the same amount of time was spent in hand pulling weeds.

The crop was dug during the latter part of September, Hallock's potato digger being used on the greater part of the field. This does not bring all the tubers to the surface, and the potato hook was used to rake them out of the loosened earth. By far the largest item of cost is that for digging.

Below is the account:

Dr.

To ½ cost of manure at $4.00 per cord . .	$100 00
" ¾ " " fertilizers	150 00
" 125 bushels seed at $1.00	125 00
" preparing land, planting, and cultivating . .	161 00
" cost of digging	178 00
	$714 00

Cr.

By 3,500 bushels of potatoes at $ .50 . .	$1,750 00
Balance in favor of crop . . .	1,036 00

CHRYSANTHEMUMS.

The place which the Chrysanthemum now holds as a fall decorative plant justified the Committee in offering prizes that would encourage the grower to show his best skill in their production. It is one thing to see them in the Hall arranged for exhibition purposes; it is quite another to see them arranged in the conservatory for their best effect. As might have been expected we received several applications, nearly all the places possessing points of merit, and we have tried in our awards to recognize all who applied, in a way which we trust will be satisfactory to the applicants.

In these days of advanced cultivation of this popular flower, when so much is being written and published in every horticultural journal, and special papers have been prepared and presented to societies, it does not seem wise for us to undertake any extended remarks in this report, and we will only call your attention to the statements of those to whom prizes have been awarded.

WALTER HUNNEWELL'S CHRYSANTHEMUM HOUSE, WELLESLEY.

We have taken pains to describe as correctly as possible the varieties in this collection, which received the first prize, and which were in every way a very superior lot. They were grown by T. D. Hatfield, gardener to Mr. Hunnewell.

A. H. Fewkes.— Yellow, a bushy, even grower, with good clean foliage down to the pot; in fact this feature characterizes all of the young plants.

Cullingfordii.— The brightest shade of crimson; a large and fine reflexed flower.

Duchess of Connaught.— Pink.

Eiderdown.— White.

Fascination.— A large lemon yellow flower, with long twisted petals.

George W. Childs.— Deep crimson, without any shade of brown; the best of its color.

Gloriana.— Clear lemon yellow; petals broad, folded, and incurved into a ribbon-like ball — a rare feature.

Gougac.— Particolored; a sport from Mrs. Irving Clark, and identical with that variety except in color. Mrs. Irving Clark is a pink variety, and this is normally a white sport from it, but the plant which the Committee saw had sported back to some extent, some flowers being partly white and partly pink in all shades or degrees, or wholly pink or white or bronze. It is more desirable for exhibition than for commercial use.

Ivory.— Pure white, and said to be the finest white in cultivation.

Joseph H. White.— A white, globular flower.

Lady Mayfair.— Pink.

Louis Bœhmer.— Silvery pink.

Mrs. Bishop.— Lemon.

Mrs. Hicks Arnold.— Large, full, double flowers, of an old gold color, lighting up wonderfully under electric light.

Mrs. Jerome Jones.— White; the most beautiful late white in cultivation.

Mrs. Joseph Rossiter.— Blush white.

Mrs. Walter Baker.— Orange.

Mrs. W. G. Newitt.— White flower of immense size; a very valuable variety.

Olga.— Pink; large, and has many good traits, but has been superseded by newer sorts.

V. H. Hallock.— Pearly rose, deeper in the centre.

Walter Hunnewell.— Bronze yellow; extra large, perfectly double, incurved, dwarf.

W. H. Lincoln.— Bright yellow; a large, splendid flower.

William Falconer.— Large, white, shaded with pink. The catalogues all speak in raptures of this variety.

In regard to Mr. Hatfield's method of culture, we are happy to present the following notes by him:

"In size the plants were very even. Ivory measured four feet six inches in diameter, and was the smallest; Hicks Arnold, six feet six inches; this was the largest. Others measuring six feet were Louis Bœhmer, A. H. Fewkes, Joseph H. White, and Mr. H Cannell. The remainder measured between five and six feet each.

I strike cuttings in February and keep the plants growing steadily, not forcing with rich soil, stimulants, or heat. About the middle of May, I shift my plants into ten to twelve-inch pots, having carried them along until this stage in seven-inch. The soil, not an important feature, is moderately rich. The drainage is good. I do not pack firmly, or fill the pots very full, leaving room enough for an inch or so of top dressing. Stopping is done regularly, almost daily; the main object being to keep the plants even, looking out for any runaway shoots and encouraging weaker ones. I discontinue stopping about the first of August, but do not hesitate to take out a stronger shoot, if one appears after that date, or indeed at anything necessary to keep the plants symmetrical, which is easier than tying them so.

Watering and the application of stimulants are the most important elements of success. When the drainage is good, water can be applied freely, but it must always be with a thorough knowledge of the needs of individual specimens. Withhold stimulants from a sick plant, and also from a very vigorous plant. Syringing can be done three times a day during bright weather, and must be thorough to keep down insects. Disbudding must be practised vigorously, with very few exceptions. I allow more than one bloom to a shoot in order to fill out a thin spot. I discontinue stimulants when the buds show color, and give a little fire heat, with less side air as a precaution against mildew."

Arthur Hunnewell's Chrysanthemum House, Wellesley.

To this was awarded the second prize for the best house of Chrysanthemums; it contained many fine specimen plants. The varieties were

Ada Spaulding,
C. B. Whitnell,
Cullingfordii,
Duchess of Connaught,
Étoile de Lyon,
George W. Childs,
Harry May,
Ivory,
Joseph H. White,
Joseph Lester,
L. Canning,
Louis Bœhmer,
Mabel Ward,
Miss A. Manda,
Mrs. Alpheus Hardy,
Mrs. H. Baker,
Mrs. Hicks Arnold,
Mrs. Irving Clark,
Mrs. Jerome Jones,
President Hyde,
Robert Bottomly,
Savannah,
Walter Hunnewell,
W. H. Lincoln,
Yellow Ball.

H. H. Hunnewell's Plant Houses, Wellesley.

In connection with the visits to the two places above named, a call was made at H. H. Hunnewell's. The conservatory was charmingly arranged in the most tasteful manner. In the windows opposite the drawing room, the superb display of Orchids was an exhibition in itself; the Cattleyas could not be excelled. The conservatory proper was arranged chiefly with Chrysanthemums; on either side was a row of Yews, forming a fine background for the flowering plants; while four large Seaforthias at either end, with Dracænas and other foliage plants placed among the Chrysanthemums, lessened materially the sameness of so many flowers in a large body. The effect of this combination was very pleasing, and furnished a good suggestion for those who arrange plants for effect in exhibitions. A hasty look through the other houses, showed the same excellent care that has always characterized this fine estate. It is always a pleasure to visit Mr. Hunnewell's grounds, and Mr. Harris's cordiality is as unbounded and hearty as ever, and although he realizes and acknowledges that he is not as young as he once was, his enthusiasm is unabated, and progressive horticulture is as ardently encouraged by him now as in the years long since passed.

John L. Gardner's Plant Houses, Brookline.

By invitation of C. M. Atkinson, the gardener, the afternoon of November 14 was very pleasantly and profitably spent in looking over the various houses and the grounds at this well kept place. As a rule, at this season of the year, but little is expected in the way of flowering plants except the Chrysanthemum, but of these there was an excellent display — combined with foliage plants — in the vineries. A broad walk extended through the centre, and the plants were arranged on either side, and by opening the large double doors, leading into the adjoining greenhouse, a very pleasing effect was obtained. Although it was evident that the plants were not grown for specimens, each one might properly be called a specimen plant, for they were all nice plants and of a a size easy to handle. The collection was large and choice, embracing the leading varieties. We all well know that what Mr. Atkinson does, is always well done, and for effective display your Committee have not seen any houses more artistically arranged than this one, and the conservatory of H. H. Hunnewell, already alluded to. To give a list of the varieties is unnecessary as two lists have already been given, which is quite sufficient to guide any one desirous of making up a collection.

The plants in the other houses were all in excellent condition, especially the cool orchids, on which the promise of an abundant bloom later in the season was visible. Bulbs were growing in the frames in abundance; the stocky and healthy Cinerarias and Primulas in the frames already indicated what might be looked for later on, and at a future time we hope to be able to give a more detailed account of the many choice things found at this place.

Charles V. Whitten's Chrysanthemum Houses.

A commercial establishment is by no means void of interest, especially where good cultivation is the rule. In the first part of this report your attention was called to the lilies produced at this place, and we now take pleasure in giving to you an account of the Chrysanthemums grown here. Mr. Cotter informed the Chairman of your Committee, that they intend to discard every variety, no matter what good qualities it may otherwise possess, if it is not a first class marketable kind. This year there were fifteen thousand plants of Chrysanthemum grown for their flowers, in five

houses; each plant bore from one to four flowers, according to its strength at the time of planting. The first house was planted on the 5th of July, the last on August 1. Flowers were being cut and marketed in quantity by the 15th of October, and it is expected they will continue until the middle of December. Mr. Cotter adds that chrysanthemum growing is not a paying industry this year. The varieties which are grown in large quantities are:

White, Ivory, Miss Minnie Wanamaker, Pelican, and Mrs. Humphries.

Pink, Mrs. John M. Gerard, Viviand Morel, V. H. Hallock, Ada Spaulding, L. B. Bird.

Yellow, Golden Wedding, W. H. Lincoln, Mrs. Craig Lippincott, Rohallion, H. E. Weidner.

Red, Cullingfordii, G. W. Childs.

Bronze, Harry May.

Mr. W. J. Clemson's Chrysanthemum House, Taunton.

November 1, the Committee visited the conservatory of Mr. W. J. Clemson, Taunton, which was filled with Chrysanthemums. The house containing the plants is a curvilinear structure, thirty-five by twenty-nine feet, with side benches, and a centre bench of four tiers. There were one hundred and fifty plants in ten-inch and twelve-inch pots, and about one hundred in six-inch pots. The number of varieties is seventy-five, and the mode of propagating and growing them is about the same as is practised by other growers. It may be of interest if we state that the final potting is about the 20th of June, and no pinching is done after July 10, unless it is upon straggling shoots. Plants are looked after twice daily during the hot summer months, and no water is given unless the plants really require it. A good syringing is given each evening after hot, sunny days. Very little liquid manure is given until the flower buds appear, after which it is given two or three times a week. Sulphate of ammonia and pulverized sheep manure are used alternately until the flowers are well developed. To ward off the attack of the black fly and chrysanthemum fly, the plants are syringed once in five days with kerosene emulsion or tobacco water.

The plants were all neatly staked and labelled, and were tastefully arranged. The varieties were well selected. The other houses in the range contained a miscellaneous collection of plants, such as

is usually found in a private place. Mr. W. N. Craig is the gardener and has been there about a year.

It will be noticed that we have devoted considerable time and space to the Chrysanthemum. Never before was it so generally grown, and to such perfection. The horticultural press and the daily papers every year inform us of exhibitions where none were ever held before, and the enthusiasm has justified the Society, through its three different Committees in recognizing this fact, and the Garden Committee have tried to do their full share without the appearance of riding a hobby to the neglect of other interests.

Forced Vegetables.

For several seasons there was offered a prize for the best house or houses of Forced Vegetables; but the only ones entered in competition were those of Mr. Varnum Frost, of Arlington, and they were reported upon at the time. The Committee have always been desirous of recognizing this and all other industries that would be of interest to the Society; but for some unknown reason we have not been invited to any other of these establishments, and have only seen them as individuals. The Chairman of your Committee, being in Arlington one afternoon, visited Warren W. Rawson, and very much enjoyed looking over his extensive establishment with him, and receiving from him a description of his system of working it. With the consent of the Committee the Chairman presents the following items of interest, which we hope may be acceptable to the Society.

The capacity of Mr. Rawson's plant is quite large, covering an enclosed space of 120,000 square feet of ground, the houses being especially arranged for growing lettuce and cucumbers. The first sowing of lettuce seed is in August, and additional sowings are made every five days until time to set out of doors. With so large a space Mr. Rawson can raise and head at one time, fifteen thousand dozen of lettuce. There are fifteen houses; the largest is 400 feet long by 52 feet wide. The larger ones are used for heading the lettuce. Those for growing the plants, which Mr. Rawson considers small, are 130 feet long by 22 feet wide. A new crop of plants for heading is set in one of the larger houses each week. There are eight of these houses for heading and it takes about eight weeks to mature a crop in the months of

October, November, December, and January. By this arrangement there are two thousand dozen of lettuce for sale each week until May 1st. Preparations are made for cucumbers, and they commence setting the plants in the houses about January 15. These begin bearing in about four weeks after the first house is set, the others following about one week apart as the lettuce is taken out. When there are a number of houses in bearing the quantity of cucumbers produced is from ten to fifteen thousand per day. There are three crops of lettuce, and one crop of cucumbers, grown in each house every season. You will see that a large number of men are required to run a plant of this size. The heating is done by steam. There are six boilers of from forty to sixty horse power each; two are placed side by side, of which one is run in moderate weather, and both in very cold weather, and it takes 700 tons of Cumberland coal each season to do what is required. In addition to the houses, three thousand hot-bed sash are used, the whole producing over one million heads of lettuce and as many cucumbers each season, which are all sold in Boston and New York. At this time (December 15, 1893), Mr. Rawson is shipping over one hundred barrels of lettuce to New York each week.

This very brief outline of a plant of the magnitude of this one, gives only a very general idea of what it is; the details would make a small book. A very important item of course is the capital — which cannot be a small one — with which to run it. Then the management enters largely into the results; it is very easy to sink one's capital in the management, but the thorough system of working, which was clearly manifest from the seed bed to the matured crop, gave abundant evidence of the success of the management. Some may suggest that a comparison of expenses and receipts would be the best evidence of financial success, but as the prices of supplies vary, and also those obtained for the produce, it might be a misleading statement. One thing is sure, that where the plant is being enlarged each year, there must be reasonable success, and as Mr. Rawson has had fifteen years' experience, we feel confident that the statement here presented as the result of that experience, will commend itself to your consideration.

The Committee have made the following awards:

PRIZES.

For the best aquatic Garden, to William W. Lee, Northampton	$50 00
For the best house of Chrysanthemums, to T. D. Hatfield, Gardener to Walter Hunnewell, Wellesley	50 00
Second, to Arthur Hunnewell, Wellesley	30 00

Gratuities:—

To Lawrence Cotter, Gardener to Charles V. Whitten, Dorchester, for a fine house of Lilies, grown for commercial purposes	40 00
To Lawrence Cotter, Gardener to Charles V. Whitten, Dorchester, for fine houses of Chrysanthemums, grown for commercial purposes	40 00
To John L. Gardner, Brookline, for a house of Chrysanthemums, in excellent taste with other plants	40 00
To W. N. Craig, Taunton, for a house of Chrysanthemums	20 00
To the Massachusetts Agricultural College, Amherst, for a well cared for and successfully cultivated Vineyard	50 00
To the Massachusetts Agricultural College, for successful general cultivation of Fruits	30 00
To the Massachusetts Agricultural College, for successful cultivation of Vegetables	50 00
To Warren W. Rawson, for superior cultivation of Vegetables, under glass	40 00
Total awards	440 00
Unexpended balance	60 00
Amount appropriated	$500 00

Respectfully submitted,

JOHN G. BARKER,
E. W. WOOD,
DAVID ALLAN,
A. H. FEWKES,
C. N. BRACKETT,
HENRY W. WILSON,
JACKSON DAWSON,
Committee on Gardens.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1893.

By JOSEPH H. WOODFORD, Chairman.

The exhibitions of our Society, during the past year, have been quite as numerous as in former years, yet at only two of them has there been an admittance fee asked. The Committee for Establishing Prizes made up the Schedule with this end in view, and it has been faithfully carried out by the Committee of Arrangements.

About the same amount of labor is required whether the shows carry an admittance fee or whether they are free; therefore it does not make an appreciable difference in the labor required at an exhibition, but it does make a difference in the attendance at the shows, a greater number of persons coming to our free shows than to the shows where an admittance fee is charged.

We report that all the exhibitions have been very fully attended throughout the year, and we append hereto the statement of receipts and expenditures as taken from the Treasurer's books. The balance in favor of the Society does not differ much from that of last year, and would not have been very much augmented if we had charged an admission fee to all the principal shows.

We are more than ever under obligations to the newspaper reporters, who so eloquently described in fitting terms our various exhibitions, for their notices during the year have been copious and commendatory. We are also pleased to note that more

interest than usual has been manifested during the past year by the owners of plants and their gardeners, in contributing to our shows, thus making them successful as exhibitions and worthy of our Society.

The arrangement of the plants and flowers during the year has been so varied as to produce the most pleasing effect, and has met the general approbation of the public.

The other Committees, in their yearly reports, will tell you of the progress we are making in the noble art of Horticulture, and we have no doubt that their reports will be read with pleasure by every member of our Society.

The receipts of the		
Spring Exhibition were	$372 00	
Chrysanthemum Show	1,292 00	
		$1,664 00
Expenditures:		
Spring Exhibition	$280 10	
Chrysanthemum Show	289 05	
		569 15
Showing a balance of		$1,094 85
which has gone into the Treasury of the Society.		

All of which is respectfully submitted,

JOSEPH H. WOODFORD,
Chairman.

REPORT

OF THE

COMMITTEE ON WINDOW GARDENING,

FOR THE YEAR 1893.

By Mrs. HENRIETTA L. T. WOLCOTT, Chairman.

In considering the preparation of a report for the Committee of which I am the Chairman, I am compelled to ask your attention to a recital, which may seem tedious, but which it is hoped may not prove uninteresting.

In the near future the Committee will suggest a change of title from that of "Window Gardening Committee" to that of "Committee on Children's Herbariums and School Gardens." The reasons why the suggestion is made and the reasons why the petition should be granted ought to be made somewhat prominent at this time.

In the year 1878 a request from parties, not active members in this Society, but philanthropists in the grandest sense, was placed before the Society. Funds to defray all expenses incurred in carrying out their plan, were promised. It was to teach children to raise flowering plants in pots and to care for them, that desolate homes might become attractive. This appealed to a number of willing workers. The first Committee appointed by the President, expected to work early and late, in an untried field, without pecuniary consideration, but to be recompensed if in so working the end desired by the founders of this Society should be accomplished.

To reach the children in so large a city as Boston, at the first stage of the experiment, correspondence was held with the Superintendents of large Sunday Schools and Missions and other organizations for children. Clergymen became cordially interested, and the suggestion of the Committee, to substitute growing plants for cut flowers at Easter, was at once adopted. The mercantile value of this idea to florists should have won over that industrious class of our citizens. In one season over thirteen thousand plants in pots were distributed in Boston and the suburban churches, while in other cities and towns, the same relative increase was observed. Changes among the earnest friends of the movement dampened the ardor of the Committee. Of the six pastors whose coöperation was so helpful, two, Rev. Mr. Gerry of the Hanover street District Mission, and Rev. Phillips Brooks, are no longer living; two have removed to other parishes—one to an asylum for over taxed clergymen.

The two remaining friends saw with regret the difficulties which confronted the Committee. The greatest was the indifference of the members of this Society—trivial, you may think when others meet it, but quite important when we ourselves are the annoyed.

Another difficulty was found in securing the plants at the hour advertised, with also the added difficulty of disposing of their owners during the time devoted to the exhibition, for little children could not come alone from the suburbs, and the expense of car fares often exceeded the sum awarded for the well-raised geraniums. Out of the city, where teachers or others devoted themselves to the work, most excellent results were obtained. In one instance, over two hundred plants were exhibited, with many vases of native flowers culled in the fields, and prizes were awarded for those advertised, while gratuities were granted when patience was shown in keeping pot and plant clean.

Soon the Committee dwindled. Raising, not forcing, small plants was not profitable, and for several seasons the working force of the Committee consisted of but two members. The correspondence was no small item in the burden carried. The experiment attracted attention in many localities, and letters of inquiry as to the methods adopted, were received.

In obedience to a demand for some simple directions to children, as to collecting blossoms for exhibitions, in July, August, and September, and where and when to look for them; also regarding

the care of plants in pots, a small pamphlet was compiled for general distribution.

While we were quite satisfied with this, we soon became conscious of the narrowness of scope in the plan. We had become inoculated, as it were, with the sentiment so often witnessed in this, our beloved headquarters.

We had lost sight of the fact that the whole state of Massachusetts would be traversed by earnest scholars, searching for wild flowers. But the work of one honored member, Eben H. Hitchings, has not been in vain. His faithfulness, his untiring industry, and his unquestioned knowledge have been, and will be, recognized by students of the pamphlet, who are by no means confined to Massachusetts nor, indeed, to the New England States. The expense drew most heavily on our appropriation, and at one time almost wrecked us financially, but the Committee have never regretted issuing it. It is now out of print.

While there have been most encouraging signs that the idea of teaching little children to raise and care for plants, in crowded city lanes and streets, could be carried out, it became evident to the Committee, that other work for children could be introduced into schools and homes, which would serve as good a purpose, and the results could be much more easily exhibited. Therefore a resolution to offer prizes for pressed flowers, ferns, and grasses was adopted. To stimulate the young people, quite large sums were offered for the best collections of each. This, it was hoped, would find many young pupils ready to attempt the work. To encourage them to begin, would possibly prove the first step towards success.

The Committee also believed that by this early training, the observing faculties of the children would be so educated in artistic forms, as seen in plants growing naturally, that the present tendency to exhibit in the public gardens of the country, flowers, or rather plants, from which all blossoms are sheared off, arranged in grotesque designs, would in time gradually disappear. The portraits of distinguished men; the symbols of trades; attempts to put spiritual suggestions into very material shapes; the plans of carpet gardening which drive the housekeeper frantic at seeing rolls of carpeting framed and left out in rain and sunshine—have run riot so long, that the Committee realized that but little could be done to displace them, except by educating the future superintendents of public grounds, denominated gardens and parks.

We admit that some men do not receive education, in the line of improvement, with cordiality. But something has been done in this line. In the neighborhood of Boston the superintendent of one of the largest cemeteries has wrought marvellous changes by relegating the horrid, glaring combinations of colors, to the unfrequented paths and substituting graceful shrubs and perennial plants with the happy result of a succession of flowers.

Visitors to the Columbian Exposition contrasted, with delight, the arrangement of beds, walks, and shruberies there, which were designed by Frederick Law Olmstead, a member of this Society, with crude plans at the Parks outside his special domain. But the crowds who gazed with pleasure at the latter numbered more in proportion, just as the throngs in pursuit of coarse entertainment, who delight in double-headed calves and no-armed men, are double the crowds at the florists' windows, which offer daily rich treats to those who cannot purchase.

The increasing quantity of flowers exposed for sale on the streets attests the growing love of flowers. On Saturday nights in summer, the throng on the sidewalk extends from Pemberton square to Howard street, hurrying to buy of the venders who crowd that locality, with their baskets of pinks, roses, pansies, etc., which they offer at low prices. They accompany the transfer with the marvellous assertion that "the freshness and fragrance will well repay the purchaser." What matter, if the fading rose takes with it the sentiment of the old, old story, and the young woman carries it off triumphantly, little heeding the drooping leaves? It answers to press for future enjoyment.

In presenting the report of a Public School Garden, we desire to emphasize the true idea of the school garden. The education which is supposed to result from planting, in military precision, rows of plants, replaced by others like magic, does not seem to the Committee to have any value. It can only be regarded as failing utterly in any educational line.

But growing plants, from the first sign of germination to the full perfection of blossom and fruit, and the edible roots in all stages, give constant opportunity for study. The everchanging condition becomes most interesting to the students, and teachers must observe, that while our leading colleges keep grown men at work, watching growth in feet and inches; also the power of growing cells to lift weights,— as was done at Amherst some years

ago — the active mind of a well balanced child, is also an exceedingly interesting field to cultivate.

Report on the George Putnam School Garden, Season of 1893.

The plants named below were introduced into the garden during the season of 1893:

Sanguinaria Canadensis.
Osmorrhiza longistylis.
Geranium maculatum.
Lysimachia quadrifolia.
Polygonatum biflorum.
Asclepias quadrifolia.
Polygala paucifolia.
Solidago arguta (2 clumps).
Solidago puberula (3 clumps).
Boltonia glastifolia.
Juniperus communis.
Aspidium Noveboracense.
Aspidium acrostichoides.
Asplenium Filix-fœmina.
Dicksonia punctilobula.
Osmunda regalis.
Botrychium lunarioides.
Clematis paniculata.

There are now eight varieties of hardy chrysanthemums in the garden, named as follows: Pearl Button, Lilliput Button, Brown Bob, Philip Pompon, Lucretia Crocker, George Putnam, Mrs. Wolcott, Chrys Parvus. The intention is to have a set of twelve, to be called the George Putnam set, and to propagate them sufficiently to obtain some revenue by their sale to schools or persons desiring such plants, the revenue to be devoted to the support of the garden. Two new varieties have been promised already.

The eight varieties named were exhibited at the regular fall Exhibition of Chrysanthemums, and given a gratuity of three dollars, to which more money was added, and the whole was expended for manure to fertilize the ground thoroughly. Previously, application had been made to the School Committee for manure, but, ostensibly in the interest of the strictest economy, the application was refused, although the city has manured the land but once in the history of the school, of more than a dozen years' duration. In view of this, the generous and unexpected gratuity of the Massachusetts Horticultural Society is fully appreciated by all interested in the school garden.

Golden rods and asters were planted under large ash trees in the corners of the garden, but the trees kept off the rain from a large

area, and their roots came close to the surface and exhausted the fertility of the soil to such a degree as to necessitate the removal of all the plants named, even *Aster corymbosus* and *A. macrophyllus*, which commonly grow under trees.

Not the least interesting are the plants that seem to have introduced themselves into the lawn of the garden in great abundance, enough to supply the whole school with plants for study. At one time dandelions abound, then violets, then cinquefoils. Whole classes go out in school hours and gather them for study, and the next year they will be as abundant as ever.

The intention is to have a good assortment of native ferns growing in the garden. Their study is to be facilitated by the use of lantern slides made from negatives of all the common species. The solar camera will enormously enlarge their images when thrown on the screen, and all their characteristic parts may be plainly seen by a whole class at once. Nine species are already in the garden, and some photographs of fronds have been taken.

The pods of the Scarlet Runner, the seeds of which were supplied by the Herbarium Committee, have furnished excellent material for the study of legumes, both in drawing and written description.

The third season of the garden closes with bright anticipations of the fourth.

HENRY L. CLAPP,
Principal of the George Putnam School.

The appended list of prizes tells the result of the examinations by members of the Committee, who faithfully attended to that duty. The Chairman pleads guilty to having been absent in another State until the display was ready for the exhibition.

Of that we can say that rarely could be found the work of school children — very often with little help — in better condition. The patience, industry, and enthusiasm shown should be recognized by teachers and friends.

The freshness of color of many flowers, and the subtle odor of roses and ferns which pervaded the hall, brought back the memories of summer strolls amid such things so vividly, that we became somewhat sentimental, and but little disposed to criticise even those sheets where the tips and toes of the specimens were

curling up for want of proper gumming material, or those where the specimens were strapped to their beds, like surgical cases in the hospital. A little less bandaging in one exhibit, a little more in another, would possibly have taken the pleasure of the Committee entirely away, because we do not expect to find experienced work among the children.

The whole area of the Lower Hall was used and a collection of one hundred and twenty-five specimens was to be seen in the Upper Hall.

The examiners were many, those interested in teaching being in the majority. Many of our members were there, but alas! many others were conspicuous by their absence; however, the loss in every case was theirs. Many who did examine went away with reports and pamphlets, ready to introduce this work in other places.

The following prizes and gratuities were awarded to children who exhibited Herbariums in Horticultural Hall, December 1 and 2, 1893:

GRASSES.— First prize for thirty specimens, Arthur C. Faxon	$3 00
FLOWERS.— Special prize for fifty additions, Phillips Barry	2 00
First prize for one hundred and twenty-five specimens, Arthur C. Boylston	5 00
Second prize for one hundred and twenty-five specimens, Mabel James	4 00
First prize for one hundred specimens, Elizabeth C. Dudley	4 00
First prize for fifty specimens, Nellie S. Morris	2 00
Second prize for fifty specimens, Lucy C. Lewis	1 50
First prize for twenty-five specimens, Mabel C. Macomber	1 50
LEAVES.— First prize for thirty-five sheets, Ethel M. Sargent	2 00
Second prize for thirty sheets, Mabel L. Trask	1 00
Third prize for twenty-nine sheets, Hannah B. Johnson	75
Amount of awards in prizes	$26 75

Gratuities: —

Mary B. Field, twenty-five flowering plants . .	$ 75
Ada K. Wood, thirty sheets of leaves . . .	70
Kate A. Dwyer, twenty-four sheets	60
Rosamond Amos, twenty-five sheets	60
Athelstan Brandt, twenty-three sheets	60
Pauline Brandt, twenty-six sheets	60
Rosie M. Spenceley, twenty sheets	60
Lucy C. Lewis, twenty sheets	60
Arthur C. Faxon, collection of leaves	50
Amount of Gratuities	$5 55
Total awards	$32 30
School Gardens.— First prize, George Putnam School	$15 00
Total awards of all kinds,	$47 30

W. E. C. RICH,

Secretary.

The Committee desire to state for the benefit of the members of the Society that while the appropriation of $250 is asked for annually, about two-thirds of the sum only has been expended. It will be observed that the above report of awards does not equal the gratuities paid for common flowers in the weekly exhibitions of the Society, yet hundreds of children have been interested and educated.

Henrietta L. T. Wolcott,
Henry L. Clapp,
W. E. C. Rich,
Josephine L. Richards,
} *Committee on Window Gardening.*

REPORT

TO THE

STATE BOARD OF AGRICULTURE.

FOR THE YEAR 1893.

By GEORGE CRUICKSHANKS, OF FITCHBURG.

The Massachusetts Horticultural Society began the year with a course of Lectures and Discussions on subjects of special interest to the horticulturist, by the following named speakers:

January 14. Village Improvement, by B. G. Northrop, LL.D., Clinton, Conn.

January 21. Landscape Gardening, by Warren H. Manning, Brookline.

January 28. Historical Sketch of English Horticulture, by Samuel Henshaw, West New Brighton, Staten Island, N. Y.

February 4. The Economics of Horticulture, by Hon. Henry L. Parker, Worcester.

February 11. Combatting the Fungous Diseases in Plants; Progress of the Work in the United States, by B. T. Galloway, Washington, D. C.

February 18. Wild Flowers and Ferns, by Mrs. P. D. Richards, West Medford.

February 25. The Carnation and its Culture, by Richard T. Lombard, Wayland.

March 4. Poisonous Plants, by Professor William P. Brooks, Amherst.

March 11. Aquatic Plants and Their Culture, by L. W. Goodell, Dwight.

March 18. Tuberous Rooted Begonias, by John G. Barker, Superintendent of Forest Hills Cemetery, Boston.

March 25. A Visit to Japan, by James Comley, Lexington.

These meetings are always well attended, and much interest is taken in both the lectures and the discussions which follow the

lectures. These are published in the TRANSACTIONS of the Society, which are free to all its members.

The sum appropriated for Prizes and Gratuities for 1893 was $7,850. Much is done by this Society to encourage the art of Horticulture, by offering liberal prizes for the best Vegetable Garden and best Fruit Garden; the best Vineyard and the best kept Greenhouse.

The Spring Exhibition opened March 21, and continued four days. The Lower Hall contained a fine show of early Vegetables, and Winter Apples and Pears. In the centre of the hall was a rich display of Azaleas, Genistas, and other plants in bloom. The great attraction was in the Upper Hall where were several choice collections of Spring Flowering Bulbs, which included the fragrant Hyacinths, Lilies of the Valley, Tulips, Narcissusses, Jonquils, Freesias, Polyanthuses, and Roman Hyacinths. On the platform the President of the Society exhibited a very choice collection of Orchids. On the tables in the centre of the hall were fine displays of Cinerarias, Cyclamens, Primulas, and Pansies.

The Rose and Strawberry Show opened June 22, for two days. The Roses were displayed in the Upper Hall and were up to the usual high standard of this Society. Besides the roses there were quantities of other flowers,— one collection of one hundred named varieties of Pæonies,— and very attractive displays of Gloxinias, Herbaceous Plants, and Hardy Flowering Shrubs. The show of Strawberries was excellent. New varieties are coming in and taking the places of some of the older sorts. The Marshall, a recent introduction, is taking the lead of all other varieties. Other prominent kinds were Bubach, Leader, and Jessie. The show of early Vegetables was fine.

The Annual Exhibition of Plants and Flowers began September 6, and continued two days. The chief attraction in the Lower Hall was a display occupying the entire platform. This collection comprised a very large variety of choice Roses, Hydrangeas, Phloxes, Asters, etc., backed with foliage of Cannas. Other cut flowers were Zinnias, Tuberous Begonias, Dahlias, Tropæolums, Marigolds, Petunias, Dianthus, Cannas, and Gladioli. The Upper Hall was filled with some of the finest flowering and ornamental leaved plants that the greenhouses in the vicinity of Boston could furnish, each exhibit being arranged under the immediate direction of the able Committee of Arrange-

ments, so as to produce the best effect. The collections of Ornamental Leaved Plants were very fine. They included Crotons, Dracænas, and Caladiums, with Palms, Tree Ferns, Adiantums, and Lycopodiums. A beautiful show of Aquatic Plants in two large tanks attracted much attention. In front of the platform were some fine bunches of Foreign Grapes; some of the bunches weighed between eight and nine pounds each.

The Annual Exhibition of Fruits and Vegetables began October 4, and continued two days. The choicest specimens from the garden and the orchard are placed on the tables of the Society at this gathering, and a finer display of fruit has never been made in Horticultural Hall. Many varieties of Apples and Pears were of the largest size. Gravenstein and Hubbardston Apples; Seckel, Bosc, and Sheldon Pears; Concord, Worden, and Delaware Grapes, were all of the best quality. The vegetables were shown in the Lower Hall. They were all well grown.

The Chrysanthemum Show opened November 7, and was held four days. This exhibition is looked forward to by all lovers of flowers as the crowning show of the year. This Society is noted for its splendid exhibitions of everything pertaining to Horticulture, but if it excels in any one line, it is the Chrysanthemum. The introduction of this flower into Europe dates from the latter part of the last century. The first seedling raised in Europe was produced in 1827 — sixty-six years ago. The Japanese varieties that are so much admired now, were not known here until 1860. What a change! and it could all be seen at the Chrysanthemum Show of 1893. In Japan this is, and long has been, the national flower. There it is used as a royal seal, and the highest order in that kingdom is the Order of the Chrysanthemum.

The Upper Hall was devoted to the pot-plants. One exhibit, of one hundred varieties, included all the different colors; the pure white, yellow from the palest straw to the deepest old gold, purple, pink, rose, and carmine. All the classes were represented by well grown specimens, with an abundance of clean healthy foliage. In the Lower Hall the cut blooms were arranged. The variety of color, the size and form of the flowers, the great number of seedlings seen for the first time, many of them showing new combinations of color, with fine healthy foliage, together formed an exhibition of beauty and brilliancy beyond description.

GEORGE CRUICKSHANKS, *Delegate.*

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1893.

As far as the concerns of the Library go, the year which is now drawing to its close has been much like its predecessors; the Society's regular appropriation has been expended for the usual magazines and binding; the Card Catalogue of Plates has made progress, though not as much as in some years; the income of the Stickney Fund has continued to draw the best botanical and horticultural works to this room, and the extra appropriation of one hundred dollars for binding has enabled much of the accumulated matter to be properly bound and prepared for consultation.

It is desirable that attention should be called to the value of the ever increasing mass of reports of the experiment stations of all parts of the country. The majority of these are of very great importance, especially those which treat of fungoid and other maladies of plants. The national government publishes a review of all of these from time to time.

Mention has occasionally been made that we have reached the limit of our space, and that the objectionable practice of putting books out of sight behind others had for some time been necessary. As may be seen from the Librarian's reports the material acquired by gift or exchange equals in amount that which we purchase from the income of the Stickney Fund so that, even if the latter source of supply were to be taken from us now instead of continuing for five years more, the need of further

space would still be a pressing one. The best way to meet this, as it seems to us, is to build a gallery around the librarian's room similar to that in this room and to place bookcases therein. This will not afford as much space as needed, it is true, but still enough to alleviate the pressure very much.

Last year this Committee stated that the time had almost come when we should be obliged to ask for this additional space; we now say that the time has fully arrived and we accordingly request that a committee be appointed to obtain an estimate of the cost and to report at the earliest opportunity.

For the Committee,

W. E. ENDICOTT,

Chairman.

If the arrangement of previous TRANSACTIONS were kept up, the list of Library Accessions would here follow the Report of the Committee on the Library, but so much time is unavoidably required to prepare this list that in order to avoid delaying the printing of the TRANSACTIONS, the Committee on Publication have directed that it be placed at the end of the book.

REPORT

OF THE

SECRETARY AND LIBRARIAN,

FOR THE YEAR 1893.

Little can be said in these departments to vary this report from those of preceding years. The same gradual growth which has been recorded in reports of previous years has occurred in that now closing. The work of editing and printing the TRANSACTIONS has been pushed to completion as rapidly and early as possible, but the disabling for two or three months of the person employed to assist therein was an unfortunate interference with the rapid progress of the work. The list of Library Accessions during the year 1892, it will be noticed, occupies forty-five pages instead of twenty-seven as in 1891. This list requires much labor and care in preparation to ensure accuracy — more than any other portion of the TRANSACTIONS — and the great increase in length noted, added materially to the time required to edit and print the work. This list would of itself in point of size form a respectable catalogue; indeed it is larger than the catalogues of many public town libraries, and it is beyond comparison more difficult to prepare, but it may be considered as forming an Annual Supplement to the Library Catalogue and therefore no pains have been spared in its preparation to ensure fulness and accuracy.

The record of books added to the Library in 1893 is not as long as that of 1892, but it shows an increase of nearly fifty per cent over that of 1891. The great number of additions to the Library has prevented as much progress in the verification and arrangement of the Card Catalogue of books as was desirable, but the work has not been overlooked. All the cards which had been written for the Card Catalogues of Plates have been arranged,

and are now available for finding the plates indexed thereon. Besides these two Card Catalogues there has this year been added a Card Catalogue, arranged by subjects, of the Literature of Experiment Stations and Kindred Institutions, prepared at the Office of Experiment Stations, and published by authority of the Secretary of Agriculture. For this Catalogue we are indebted to President Goodell, of the State Agricultural College, and for this service, and also for valuable assistance in collecting the publications of Experiment Stations throughout the country he is justly entitled to the thanks of the Society.

Among the noteworthy books added to the Library this year may be mentioned the fifth volume of Sargent's Silva of North America; the Flora Batava in eighteen volumes; Savi's Flora Italiana, in three folio volumes; Moris's Flora Sardoa; the completion of Willkomm's Flora of Spain and the Balearic Islands; the Annals of the Royal Botanic Garden of Calcutta; Reichenbach's Xenia Orchidacea; Kraft's Pomona Austriaca, in two folio volumes, supplying the greatest desideratum in this department, and two Dutch works on Pomology; all these books being illustrated with instructive plates, most of which are colored. A copy of Brunfels's Herbarium, illustrated with woodcuts, published at Strasburg, 1532–1536, which has been purchased, is the oldest book in the Library, the most ancient that we previously possessed being Fuchsius's Historia Stirpium, published in 1542. As showing the wide range of our acquisitions I may mention a set of the Jornal de Horticultura Pratica, in twenty-two volumes, published at Oporto, Portugal, and the publications of the Norway Horticultural Society, which have been received from the Secretary in exchange for our own TRANSACTIONS, and which, though they can be read by few persons here, are at least interesting as informing us of the existence of a horticultural society in that far northern country. Two South American Agricultural journals, published by the Asociacion Rural del Uruguay, and the Sociedad Rural Argentina, have for some years been received from those associations, and this year there has been added to our exchange list the name of a journal published on the opposite side of the Southern Hemisphere, the Agricultural Gazette of New South Wales.

The old question, where to put the books added to the Library is again upon us. Often it is a great perplexity, and sometimes

an utter impossibility to find an appropriate place for them. There are books now waiting to go on the shelves for which there is absolutely no proper place.

The many sets of journals, etc., purchased during the last few years have added largely to the number of books requiring to be bound. Though the additional appropriation made for this purpose has all been expended, a large number of both are still waiting to be bound. These series of journals, etc., and their binding have added largely to the work here, for the arrangement of books of the character of most of ours cannot be intrusted to the binder, and no book is ever sent to him until it is arranged exactly as we wish to have it bound. Oftentimes this is a work of much perplexity and one requiring careful study.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT

FOR THE YEAR 1893.

MASSACHUSETTS HORTICULTURAL SOCIETY *in account current to December 31, 1893, with* CHARLES E. RICHARDSON, *Treasurer.*

1893.	DR.		
Dec. 31.	To amount paid on account of the Library during 1893, viz.:		
	For books, periodicals, and binding .	$404 50	
	From income of Stickney Fund, expended for books	700 00	
			$1,104 50
	To amount paid for Furniture and Exhibition ware	. .	368 72
	To Interest on Funds for Prizes, credited below	. .	1,892 72
	To Prizes awarded in 1892, paid in 1893, as follows:		
	For Plants	$1,847 15	
	" Flowers	2,025 63	
	" Fruit	1,622 40	
	" Vegetables	980 40	
	" Gardens and Greenhouses . .	290 00	
	" Hunnewell Prizes for Rhododendrons	105 00	
			6,870 58
	To amount paid Special Prize, Miss R. Simpkins	. .	42 00
	" " on Window Gardening Committee account, 1892 .	. .	44 25
	" " on Window Gardening Committee account, 1893 .	. .	117 45
	" " Salaries of Secretary and Assistant and Treasurer .	$3,600 00	
	" " Salaries of members of Committees	940 00	
	" " Extra services in Library .	883 50	
	" " for Card Catalogue of Plates	49 99	
	" " on account of Committee on Publication and Discussion	250 00	
Amounts carried over,	. . . . .	$5,723 49	$10,440 22

Amounts brought over, ...	$5,723 49	$10,440 22
To amount paid for Heating	536 60	
" " Labor, including Janitor and Fireman . .	2,319 15	
" " Taxes for 1893 . .	2,560 00	
" " Insurance . . .	1,230 00	
" " City Water Rates . .	148 04	
" " Repairs	319 74	
" " Lighting	1,045 13	
" " Incidentals . . .	607 02	
" " Stationery, Printing, and Postage . . .	2,362 44	
" " Committee of Arrangements	400 60	
" " World's Columbian Exhibition	2 65	
		17,254 86
Total Payments of 1893	. .	$27,695 08
Balance of Cash on hand, December 31, 1893 .	. .	17,689 79
		$45,384 87

1893. Cr.

Jan. 1. By Balance of account rendered December 31, 1892		. .	$12,417 19
By Income from Building in 1893:			
Rent of Stores . .	$17,470 85		
" Halls . .	6,195 00		
		$23,665 85	
By Income from Mount Auburn Cemetery .		3,426 79	
" Received Massachusetts State Bounty .		600 00	
" " Annual Exhibitions, gross receipts . .	$1,664 00		
Less Expenses .	569 15		
		1,094 85	
" " from Admissions and Assessments		1,142 00	
" Interest received on Bonds .	$705 00		
" " " on Deposit in Bank .	214 10		
" " " from all other sources .	57 37		
		976 47	
" Received from Edward Hatch, Special Prize awarded 1893 .		50 00	
" " " Miss R. Simpkins, Special Prize awarded 1893 .		42 00	
Amounts carried over, ...		$30,997 96	$12,417 19

Amounts brought over, ...		$30,997 96	$12,417 19
By received from sale of History . .		2 50	
" " " " Transactions, .		5 00	
" " " " Duplicate book	$2 00		
" " " E. C. R. Walker, for purchase of a library book	2 50		
		4 50	
" " " H. H. Hunnewell, his prizes for 1892 . .		65 00	
" Interest credited to the following Funds against charges above:			
Samuel Appleton Fund, $1,000, at 5%	$50 00		
John A. Lowell Fund, $1,000, at 5%	50 00		
Theodore Lyman Fund, $11,000, at 5%	550 00		
Josiah Bradlee Fund, $1,000, at 5%	50 00		
Benjamin V. French Fund, $500, at 5%	25 00		
H. H. Hunnewell Fund, $4,000, at 5%	200 00		
William J. Walker Fund, $2,354.43, at 5%	117 72		
Levi Whitcomb Fund, $500, at 5%	25 00		
Benjamin B. Davis Fund, $500, at 5%	25 00		
Marshall P. Wilder Fund, $1,000, at 5%	50 00		
John Lewis Russell Fund, $1,000, at 5%	50 00		
Josiah Stickney Fund, $12,000, amount	700 00		
		1,892 72	
			$32,967 68
			$45,384 87

E. & O. E.

CHARLES E. RICHARDSON, *Treasurer.*

BOSTON, December 31, 1893.

Audited and approved,

H. H. HUNNEWELL,
NATHANIEL T. KIDDER,
A. HEMENWAY,
} *Finance Committee.*

ASSETS AND LIABILITIES OF THE MASSACHUSETTS HORTICULTURAL SOCIETY,

DECEMBER 31, 1893.

ASSETS.

Real Estate		$250,000 00	
Furniture and Exhibition Ware		6,608 46	
Stereotype Plates and copies of History		262 00	
Library		32,697 46	
Chicago, Burlington & Quincy R. R. Bonds, 7%		1,500 00	
Kansas City, Clinton & Springfield R. R. Bonds, 5%		1,980 00	
Sinking Fund, General Electric Company's Bonds, 5%		10,000 00	
A. K. Loring		359 41	
Committee of Arrangements		60	
Cash		17,689 79	
			$321,097 72

LIABILITIES.

Mortgage			$1,000 00	
Josiah Stickney Fund, payable to Harvard College, 1899			12,000 00	
Prize Funds, invested in the Building, viz.:				
Samuel Appleton Fund,	$1,000 00			
John A. Lowell "	1,000 00			
Theodore Lyman "	11,000 00			
Josiah Bradlee "	1,000 00			
Benjamin V. French "	500 00			
H. H. Hunnewell "	2,500 00			
William J. Walker "	2,354 43			
Levi Whitcomb "	500 00			
Benjamin B. Davis "	500 00			
		$20,354 43		
Prize Funds invested in Bonds:				
H. H. Hunnewell Fund,	$1,500 00			
Marshall P. Wilder "	1,000 00			
John Lewis Russell "	1,000 00			
		3,500 00		
			23,854 43	
Edward Hatch Special Prize, due and unpaid			50 00	
Prizes for 1893, due and unpaid			7,850 00	
				$44,754 43
				$276,343 29

CHARLES E. RICHARDSON, *Treasurer.*

MEMBERSHIP ACCOUNT, MASSACHUSETTS HORTICULTURAL SOCIETY,

DECEMBER 31, 1893.

Number of Life Members per last report	549		
Added during 1893	16		
Commuted from Annual	5		
		570	
Deceased		13	
			557
Number of Annual Members per last report	234		
Added during 1893	14		
		248	
Commuted to Life Membership	5		
Deceased	6		
Dropped by request	4		
" for non-payment for two years	1		
		16	
			232
Present membership			789

INCOME FROM MEMBERSHIP.

16 new Life Members, @ $30	$480 00
5 commuted to Life, @ $20	100 00
14 new Annual Members, @ $10	140 00
Assessments	422 00
	$1,142 00

CHARLES E. RICHARDSON, *Treasurer.*

Dr. *Massachusetts Horticultural Society in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1893.

To cost of filling up and improving land at Mt. Auburn for the year ending December 31, 1893, the Massachusetts Horticultural Society being charged with their proportion of the same:			By sales in January	$15 00
Birch, to Eagle and Cherry Avenues	$1,030 69		" " February	15 00
Larch Avenue	200 63		" " March	50 00
	$1,231 32		" " April	765 00
			" " May	3,568 00
			" " June	3,606 00
			" " July	1,960 00
			" " August	1,305 00
			" " September	635 00
			" " October	840 00
One quarter of $1,231.32	$307 83		" " November	2,687 50
Balance due Mass. Horticultural Society	3,426 79		" " December	160 00
		$3,734 62		$15,606 50
			Net amount received from Receiving Tomb	782 00
				$16,388 50
			Less Graves repurchased	50 00
				$16,338 50
			Deduct for Annual Expenses	1,400 00
				$14,938 50
		$3,734 62	Mass. Horticultural Society ¼ part of $14,938.50	$3,734 62

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

DECEMBER 31, 1893.

THE MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following Expenditures, for grading new lands for sale during the year 1893:

Birch to Eagle and Cherry Avenues.

408½ days, men	$919 13	
29¾ days, man and horse	111 56	
		$1,030 69

Larch Avenue (near Maple Avenue).

50 days, men	$112 50	
23½ days, man and horse	88 13	
		$200 63
		$1,231 32
One-fourth of $1,231.32 is		$307 83

MOUNT AUBURN, December 31, 1893.

J. W. LOVERING,
Supt. of the Cemetery of Mount Auburn.

I certify the foregoing to be a true copy of improvements for the year 1893, rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1894.

President.

NATHANIEL T. KIDDER, of Milton.

Vice-Presidents.

CHARLES H. B. BRECK, of Brighton. FRANCIS H. APPLETON, of Peabody.
CHARLES S. SARGENT, of Brookline. AUGUSTUS PARKER, of Roxbury.

Treasurer and Superintendent of the Building.

CHARLES E. RICHARDSON, of Cambridge.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Professor of Botany and Vegetable Physiology.

CHARLES S. SARGENT, of Brookline.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Delegate to the State Board of Agriculture.

E. W. WOOD, of West Newton.

Delegate to the Board of Control of the State Agricultural Experiment Station.

WILLIAM C. STRONG, of Waban.

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*Communications to the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Standing Committees.

Executive.

THE PRESIDENT, NATHANIEL T. KIDDER, CHAIRMAN.

THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL, *Ex officio*.

WILLIAM C. STRONG.
CHARLES H. B. BRECK.
WILLIAM H. SPOONER.
BENJAMIN C. CLARK.
FRANCIS H. APPLETON.
WALTER HUNNEWELL.

HON. J. R. LEESON.

Finance.

H. HOLLIS HUNNEWELL, OF BOSTON, CHAIRMAN.

NATHANIEL T. KIDDER.
AUGUSTUS HEMENWAY.

Publication and Discussion.

J. D. W. FRENCH, OF BOSTON, CHAIRMAN.

C. MINOT WELD.
BENJAMIN M. WATSON, JR.

For Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, VEGETABLES, AND GARDENS, *Ex officiis*.

CHARLES M. ATKINSON.
J. WOODWARD MANNING, JR.

Library.

WILLIAM E. ENDICOTT, OF CANTON, CHAIRMAN.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY, AND THE PROFESSOR OF ENTOMOLOGY, *Ex officiis*.

J. D. W. FRENCH.
GEORGE W. HUMPHREY.
EDWIN FAXON.
WILLIAM J. STEWART.

Gardens.

JOHN G. BARKER, OF JAMAICA PLAIN, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, AND VEGETABLES, *Ex officiis*.

HENRY W. WILSON.
JACKSON DAWSON.

Plants.

DAVID ALLAN, OF CLIFTONDALE, CHAIRMAN.

JAMES COMLEY.
A. C. BOWDITCH.
WILLIAM ROBINSON.
JAMES WHEELER.

Flowers.

ARTHUR H. FEWKES, of Newton Highlands, Chairman.

MICHAEL H. NORTON.
WILLIAM J. MARTIN.
J. WOODWARD MANNING, Jr.
ELIJAH A. WOOD.

Fruits.

E. W. WOOD, of West Newton, Chairman.

BENJAMIN G. SMITH.
CHARLES F. CURTIS.
O. B. HADWEN.
WARREN FENNO.
SAMUEL HARTWELL.
J. WILLARD HILL.

Vegetables.

CHARLES N. BRACKETT, of Newton, Chairman.

CEPHAS H. BRACKETT.
P. G. HANSON.
VARNUM FROST.
JOHN C. HOVEY.
WARREN H. HEUSTIS.
WILLIAM H. HUNT.

Committee of Arrangements.

JOSEPH H. WOODFORD, of Boston, Chairman.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis.*

ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus †.

Adams, Luther, Brighton.
Albro, Charles, Taunton.
Alger, Rev. R. F., Becket.
Allan, David, Cliftondale.
Ames, Frank M., Canton.
Ames, George, Boston.
Ames, Hon. Oliver, Boston.
Ames, Preston Adams, Boston.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Edward, Reading.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Atkins, Edwin F., Belmont.
Avery, Hon. Edward, Boston.
Ayling, Isaac, M. D., Brookline.

Bancroft, John C., Boston.
Banfield, Francis L., M. D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Malden.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
Barnes, William H. Boston.
†Barney, Levi C., Boston.
Barratt, James, East Pasadena, Cal.
Barrett, Edwin S., Concord.
Barry, William C., Rochester, N. Y.
Bartlett, Edmund, Newburyport.
Bates, Hon. Amos, Hingham.
Beal, Leander, Boston.
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Dedham.
Beebe, Franklin H., Boston.
Berry, James, Brookline.
Birchard, Charles, Framingham.
Black, James W., Cambridge.
Blake, Francis, Weston.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blaney, Henry, Salem.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Bocher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
†Botume, John, Wyoming.
Bouvé, Thomas T., Boston.
Bowditch, Azell C., Somerville.
Bowditch, Charles P., Jamaica Plain.
Bowditch, James H., Brookline.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Brighton.
Brackett, Charles N., Newton.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
†Brigham, William T., Boston.
Brimmer, Martin, Boston.
Brooks, J. Henry, Milton.

Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N. S.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, George Bruce, Framingham.
Brown, Jacob, Woburn.
Bruce, Nathaniel F., Billerica.
Bullard, John R., Dedham.
Bullard, William S., Boston.
Burnett, Joseph, Southborough.
Burr, Fearing, Hingham.
Burr, Matthew H., Hingham.
Buswell, Edwin W., Brooklyn, N. Y.
Buswell, Frank E., Brooklyn, N. Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Butterfield, William P., East Lexington.

Cabot, Edward C., Brookline.
Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
†Carruth, Charles, Boston.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Mount Auburn.
Chamberlain, Chauncey W., Boston.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
†Chase, George B., Boston.
Chase, William M., Baltimore, Md.
Cheney, Benjamin P., Boston.
Child, Francis J., Cambridge.
Childs, Nathaniel R., Boston.
Choate, Charles F., Cambridge.
Claflin, Hon. William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Jamaica Plain.
Cleary, Lawrence, West Roxbury.
Clement, Asa, Dracut.
Cobb, Albert A., Brookline.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, Lincoln.
Coffin, G. Winthrop, West Roxbury.
Coffin, William E., Dorchester.
Collamore, Miss Helen, Boston.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Mount Auburn.
Copeland, Franklin, West Dedham.
Cottle, Henry C., Boston.
Cowing, Walter H., West Roxbury.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
†Crowell, Randall H., Chelsea.
Cummings, Hon. John, Woburn.
Curtis, Charles F., Jamaica Plain.
Curtis, George S., Jamaica Plain.
Cushing, Robert M., Boston.

†Daggett, Henry C., Boston.
Damon, Samuel G., Arlington.
Dana, Charles B., Wellesley.
Davenport, Albert M., Watertown.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.
Davenport, Henry, New York.
Davis, John, Lowell.
Dawson, Jackson, Jamaica Plain.
Day, William F., Roxbury.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Dorr, George, Dorchester.

Dove, George W. W., Andover.
Dowse, William B. H., W. Newton.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
†Eldridge, E. H., Roxbury.
Eliot, Charles, Milton.
Ellicott, Joseph P., Boston.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William E., Canton.
Everett, William, Dorchester.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Glencove, N. Y.
Farlow, Lewis H., Newton.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L., Roxbury.
Farquhar, Robert, Boston.
Faxon, John, Quincy.
Fenno, J. Brooks, Boston.
Fewkes, Arthur H., Newton Highlands.
Finlayson, Kenneth, Brookline.
Fisher, David, Montvale.
Fisher, James, Roxbury.
†Fisher, Warren, Boston.
Flagg, Augustus, Boston.
Fleming, Edwin, West Newton.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Flynt, William N., Monson.
Forster, Edward J., M. D., Boston.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, J. D. Williams, Boston.
French, Jonathan, Boston.
French, S. Waldo, Parley Vale.
French, W. Clifford, Boston.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
†Gardner, Henry N., Mount Auburn.
Gardner, John L., Brookline.
Gibbs, Wolcott, M. D., Newport, R. I.
Gill, George B., Medford.
Gillard, William, Boston.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Reading.
Glover, Albert, Boston.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Joseph, Roxbury.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Boston.
Gray, James, Wellesley.
Gregory, Hon. James J. H., Marblehead.
Greig, George, Toronto, Ontario.
Grey, Benjamin, Malden.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., Fort George, Fla.
†Hall, John R., Roxbury.
Hall, Lewis, Cambridge.
Hall, Stephen A., Revere.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.
Hammond, George W., Boston.
Hammond, Samuel, Boston.
Hanson, P. G., Woburn.
†Harding, George W., Arlington.
Harding, Louis B., Stamford, Conn.
Hardy, F. D., Cambridgeport.
Harrington, Nathan D., Somerville.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A. M., Cambridge.
Hart, William T., Boston.
Hastings, Levi W., Brookline.

Hathaway, Seth W., Marblehead.
Hawken, Mrs. Thomas, Rockland, Maine.
Hayes, Daniel F., Exeter, N. H.
Hayes, Francis Brown, Lexington.
†Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Heywood, Hon. George, Concord.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mount Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Newcastle, N. H.
Hollis, George W., Grantville.
Hollis, John W., Allston.
Holmes, Edward J., Boston.
Holt, Mrs. Stephen A., Winchester.
Hooper, Thomas, Bridgewater.
Horner, Mrs. Charlotte N. S., Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., East Pasadena, Cal.
Hovey, John C., Cambridgeport.
Hovey, Stillman S., Woburn.
Hubbard, Charles T., Weston.
Hubbard, Gardner G., Washington, D. C.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
Hunt, Franklin, Boston.
Hunt, William H., Concord.
Hyde, James F. C., Newton Highlands.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jeffries, John, Boston.
Jenks, Charles W., Boston.
Johnson, J. Frank, Boston.
Jose, Edwin H., Cambridgeport.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, West Medford.
Kelly, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
†Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennard, Charles W., Boston.
Kennedy, George G., M. D., Milton.
Kent, John, Brookline.
†Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
†Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, John M., Boston.
Knapp, Walter H., Newtonville.

Lancaster, Charles B., Newton.
Lawrence, James, Groton.
Lawrence, John, Groton.
Learned, Charles A., Arlington.
Lee, Charles J., Dorchester.
Lee, Henry, Boston.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, North Cambridge.
Leuchars, Robert B., Boston.
Lewis, A. S., Framingham.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Swampscott.
Loftus, John P., Dorchester.

Loring, Caleb W., Beverly Farms.
Lovett, George L., West Newton.
†Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William, Boston.
Lyman, Col. Theodore, Brookline.
Lyon, Henry, M. D., Charlestown.

†Mahoney, John, Boston.
Mallet, E. B., Jr., Freeport, Maine.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Chelsea.
Martin, John S., Roxbury.
Matthews, Nathan, Boston.
McCarty, Timothy, Providence, R. I.
McClure, John, Revere.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrifield, William T., Worcester.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Newton Lower Falls.
Minton, James, Boston.
Monteith, David, Dedham.
Moore, John H., Concord.
†Morse, Samuel F., Boston.
Motley, Thomas, Jamaica Plain.
Mudge, George A., Portsmouth, N. H.
†Munroe, Otis, Boston.

Needham, Daniel, Groton.
Nevins, David, Framingham.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield
Nickerson, George A., Dedham.
Norton, Charles W., Allston.

Oakman, Hiram A., North Marshfield.
Olmsted, John Charles, Brookline.

Packer, Charles H., Boston.
Paige, Clifton H., Mattapan.
Paige, John C., Boston.
Palmer, Julius A., Jr., Boston.
Parker, Augustus, Roxbury.
Parker, Charles W., Boston.
Parker, Miss Sarah, Roxbury.
Partridge, Horace, North Cambridge.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, John E., Boston.
Peabody, Col. Oliver W., Milton.
Pearce, John, West Roxbury.
Peck, O. H., Denver, Col.
Peck, William G., Arlington.
Peirce, Silas, Boston.
Penniman, A. P., Waltham.
Perkins, Edward N., Jamaica Plain.
†Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, George Francis, Dorchester.
Pierce, Henry L., Boston.
Pierce, Samuel B., Dorchester.
Poor, John R., Boston.
Porter, Herbert, Malden.
Porter, James C., Wollaston.
†Potter, Joseph S., Arlington.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pratt, William, Winchester.
Pray, Dr. Mark W., Boston.
†Prescott, Eben C., Boston.
Prescott, William G., East Pepperell.
Prescott, William G., Quincy.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, Thomas P., Jamaica Plain.
Prouty, Gardner, Littleton.
Putnam, Joshua H., Brookline.

Quinby, Hosea M., M. D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Miss Elizabeth L., Newton Highlands.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, Hon. James P., Franklin.
Ray, Hon. Joseph G., Franklin.
Raymond, Walter, Cambridgeport.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, George W., Boston.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Cambridge.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Wakefield.
Robinson, John, Salem.
Robinson, Joseph B., Allston.
Robinson, Warren J., Somerville.
Ross, Henry, Newtonville.
Ross, Waldo O., Boston.
Ruddick, William H., M. D., South Boston.
Russell, George, Woburn.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Sampson, George R., Andover.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Saville, Richard L., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Charlestown.
†Scott, Charles, Newton.
Sears, J. Montgomery, Boston.
Shaw, Christopher C., Milford, N. H.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Siebrecht, H. A., New Rochelle, N.Y.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Jamaica Plain.
Smith, Charles S., Lincoln.
Smith, Chauncey, Cambridge.
Smith, Edward N., San Francisco.
Smith, George O., Boston.
Smith, James H., Dedham.
Smith, Thomas Page, Waltham.
Snow, Miss Salome H., Brunswick, Me.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Springall, George, Malden.
Stearns, Frank W., Newton.
Stetson, Nahum, Bridgewater.
Stewart, William J., Winchester.
Stone, Amos, Charlestown.
Stone, Charles W., Boston.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Sturgis, Russell, Manchester.
Sturtevant, E. Lewis, M. D., South Framingham.
Surette, Louis A., Concord.
Swain, Charles E., Roxbury.

Taft, John B., Cambridge.
Tarbell, George G., M. D., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Thurlow, Thomas C., West Newbury.
Tidd, Marshall M., Woburn.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
†Tolman, Miss Harriet S., Boston.
Torrey, Everett, Charlestown.
Trepess, Samuel J., Brookline.
†Turner, John M., Dorchester.
Turner, Roswell W., Dorchester.

Underwood, William J., Belmont.

Vanderwoerd, Charles, Waltham.

Vinal, Miss Mary L., Somerville.

Wainwright, William L., Braintree.
Wakefield, E. H., Cambridge.
Walcott, Henry P.,M.D.,Cambridge.
Wales, George O., Braintree.
Walker, Edward C. R., Roxbury.
Walker, Miss Mary S., Waltham.
Walley, Mrs. W. P., Boston.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Wardwell, William H., Brookline.
Ware, Benjamin P., Clifton.
Washburn, Andrew, Hyde Park.
Waters, Edwin F., Boston.
Waters, Dr. George F., Boston.
Watson, Benjamin M., Jr., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Newport, R. I.
Weld, Richard H., Boston.
Weld, William G., Boston.
West, Mrs. Maria L., Neponset.
Weston, Leonard W., Lincoln.
Weston, Seth, Revere.
Wheeler, Frank, Concord.
Wheelwright, A. C., Brookline.
Whitcomb, William B., Medford.
White, Edward A., Boston.
White, Francis A., Brookline.
White, Joseph H., Brookline.
†Whitely, Edward, Cambridgeport.
Whitten, Charles V., Dorchester.
Whittier, Hon. Charles, Roxbury.
†Whytal, Thomas G., New York, N. Y.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., West Roxbury.
Williams, Aaron D., Boston.
Williams, Benjamin B., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, Charles G., Boston.
Wood, Luke H., Marlborough.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wyman, Oliver B., Shrewsbury.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Abbott, Samuel L., M. D., Boston.
Allen, Charles L., Floral Park, N.Y.
Arnold, Mrs. Anna E., Roxbury.
Atkinson, Charles M., Brookline.
Atkinson, Edward, Brookline.
Atkinson, William B., Newburyport.

Bacon, Augustus, Roxbury.
Badlam, William H., Dorchester.
Barker, John G., Jamaica Plain.
Beard, Edward L., Cambridge.
Benedict, Washington G., Boston.
Bicknell, Hon. Thomas W., Dorchester.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southboro'.
Bird, John L., Dorchester.
Bird, Mrs. Sarah Elizabeth, Roxbury.
Bliss, Benjamin K., East Bridgewater.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., Roxbury.
Boyden, Clarence F., Taunton.
Breck, Charles H., Newton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, David H., West Medford.
Butler, Edward, Wellesley.
Buxton, Mrs. Rose, Peabody.

Carroll, James T., Chelsea.
Carter, Mrs. Sarah D. J., Wilmington.
Chaffin, John C., Newton.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Cheney, Amos P., Natick.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John Spencer, Boston.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Codman, Philip, Jamaica Plain.
Coleman, Mrs. S. H., Jamaica Plain.
Collins, Frank S., Malden.
Collins, Hon. P. A., Dorchester.
Comley, James, Lexington.
Coolidge, David H., Jr., Boston.
Coolidge, Sumner, Mt. Auburn.
Cotter, Lawrence, Dorchester.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Davis, Frederick, Saxonville.
Davis, Frederick S., West Roxbury.
Davis, Thomas M., Cambridgeport.
Dolbear, Mrs. Alice J., College Hill.
Doliber, Thomas, Brookline.
Doran, Enoch E., Brookline.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eaton, Jacob, Cambridgeport.
Eaton, Warren E., Reading.
Endicott, Miss Charlotte M., Canton.

Faxon, Edwin, Jamaica Plain.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.

Fisher, Sewall, Framingham.
Forbes, William H., Jamaica Plain.
Foster, Joshua T., Medford.
Frohock, Roscoe R., Malden.
Frost, Artemas, Belmont.
Frost, George, West Newton.
Frost, Varnum, Arlington.
Fuller, T. Otis, Needham.

Gage, Alfred P., Arlington.
Gibbon, Mrs. James A., Brookline.
Gilbert, Samuel, Boston.
Gill, Mrs. E. M., Medford.
Goddard, Thomas, Boston.
Grant, Charles E., Concord.
Guerineau, Louis, Northampton.

Haile, Hon. William H., Springfield.
Hall, Charles H., M. D., Boston.
Hall, Harry B., Roxbury.
Hall, Stacy, Boston.
Hall, William T., Revere.
Hanks, Mrs. C. Stedman, Manchester.
Hargraves, William J., Jamaica Plain.
Harris, Miss Ellen M., Jamaica Plain.
Harris, Frederick L., Wellesley.
Hartwell, Samuel, Lincoln.
Harwood, George S., Newton.
Henshaw, Samuel, West Brighton, N. Y.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hews, Albert H., North Cambridge.
Hill, Benjamin D., Peabody.
Hill, Edwin S., Clarendon Hill.
Hill, J. Willard, Belmont.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., Auburndale.
Hubbard, F. Tracey, Cambridge.
Hunt, Henry C., Newton.
Huston, Miss Katharine W., Roxbury.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.
Jordan, Hon. Jediah P., Roxbury.

Kenrick, Miss Anna C., Newton.
Kidder, Francis H., Medford.

Lamprell, Simon, Marblehead.
Lancaster, Mrs. E. M., Roxbury.
Langmaid, Mrs. Mary, Somerville.
Lawrence, Henry S., Roxbury.
Lawrence, Sidney, East Lexington.
Lee, Francis H., Salem.
Lee, William W., Northampton.
Lomax, George H., Somerville.
Lombard, Richard T., Wayland.
Loring, Charles G., Boston.
Loring, John A., North Andover.
Lothrop, Thornton K., Boston.
Loud, Mrs. Mary E., Roxbury.
Low, Hon. Aaron, Hingham.
Lowell, John, Newton.
Lunt, William W., Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Manning, J. Woodward, Reading.
Markoe, George F. H., Roxbury.
Martin, William H., Dorchester.
Martin, William J., Milton.
Masten, Cornelius E., Roxbury.
Maxwell, Charles E., Boston.
May, F. W. G., Boston.
McDermott, Andrew, Roxbury.
McDowell, Mrs. Mary, Boston.
McIntosh, Aaron S., Roxbury.
McLaren, Anthony, Forest Hills.
McMullen, Edgar, Boston.
Meredith, Albert A. H., Milton.
Meriam, Horatio C., D.M.D., Salem.
Merrill, John J., Roxbury.
Merrill, Capt. S. A., Wollaston Heights.
Milman, William, Roxbury.

Newton, John F., Roxbury.
Norton, Edward E., Boston.
Norton, Michael H., Boston.
Norton, Patrick, Boston.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Park, William P., West Boxford.
Parker, George A., Halifax.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord.
Peterson, Ellis, Jr., Jamaica Plain.
Petremant, Robert, Dorchester.
Pigott, Thomas E., Winthrop.
Pitcher, James R., Short Hills, N. J.
Plimpton, Willard P., West Newton.
Power, Charles J., South Framingham.
Prichard, Joseph V., Boston.
Purdie, George A., Wellesley Hills.
Putnam, Charles A., Salem.

Randall, Macey, Stoughton.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robbins, Oliver R., Weston.
Robinson, Nathan D., Roxbury.
Robinson, Walter A., Roxbury.
Robinson, William, North Easton.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.

Saunders, Miss Mary T., Salem.
Sawtell, J. M., Fitchburg.
Schmitt, Georg A., Boston.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Seaver, Edwin P., LL.D., Newton Highlands.
Sharples, Stephen P., Cambridge.
Shattuck, Frederick R., Roxbury.
Shedd, Abraham B., Waltham.
Sheppard, Edwin, Lowell.
Snow, Eugene A., Melrose.
Snow, Francis B., Dorchester.
Southworth, Edward, Quincy.
Spencer, Aaron W., Boston.
Squire, Miss Esther A., North Cambridge.
Stearns, Mrs. Charles A., East Watertown.
Stearns, Charles H., Brookline.
Stevens, Miss Mary O., North Andover.
Stone, Samuel G., Charlestown.
Storer, Charles, Boston.
Story, Miss Sarah W., Brighton.
Swan, Charles W., M. D., Boston.
Sweet, Everell F., Malden.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Teele, William H., West Acton.
Terry, Rev. Calvin, North Weymouth.
Tobey, Rufus T., Roxbury.
Tobey, S. Edwin, Boston.
Travis, Charles B., Brighton.
Turner, Nathaniel W., Boston.
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Weld, Charles E., Roslindale.
Wells, Benjamin T., Newtonville.
Weston, Mrs. L. P., Danvers.
Westwood, Thomas, Jamaica Plain.
Wheeler, James, Brookline.
White, Maurice P., Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilcox, George D., M. D., Providence, R. I.
Wilmarth, Henry D., Jamaica Plain.
Wilson, B. Osgood, Watertown.
Winship, Rev. Albert E., Somerville.
Winter, William C., Mansfield.
Wolcott, Mrs. Henrietta L. T., Dedham.

Wood, Mrs. Anna D., West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Worthington, Roland, Roxbury.

Young, Arthur W., Hingham.
Young, Charles S., Newton Centre.
Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVII.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments. And any subscription member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVIII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXX.—Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him. Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXX.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

The names of deceased Honorary Members may be found in Part II of the Transactions *of previous years.*

Hon. George S. Boutwell, Groton.
Hon. Ephraim W. Bull, Concord.
H. W. S. Cleveland, Minneapolis, Minn.
Hon. Joseph S. Fay, Wood's Holl.
Major L. A. Huguet-Latour, M. P., Montreal, Canada.
Edward Winslow Lincoln, Secretary of the Worcester County Horticultural Society.
Col. Theodore Lyman, Brookline.
Joseph Maxwell, Rio Janeiro, Brazil.
Rev. James H. Means, Dorchester.
Donald G. Mitchell, New Haven, Conn.
Hon. J. Sterling Morton, Secretary of Agriculture, Washington, D. C.
Baron R. Von Osten Sacken, Heidelberg, Germany.
Samuel B. Parsons, Flushing, N. Y.
Samuel R. Payson, Boston.
George W. Smith, Boston.
John J. Thomas, Union Springs, N. Y.
Hon. Robert C. Winthrop, Boston.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829, S. Reynolds, M. D., 1832, *and* Francis Summerest (or Summerer), 1833.

The names of deceased Corresponding Members may be found in Part II of the TRANSACTIONS *of previous years.*

ÉDOUARD ANDRÉ, Editor in Chief of the Revue Horticole, Paris, France.

PROFESSOR L. H. BAILEY, Jr., Cornell University, Ithaca, N. Y.

NAPOLEON BAUMANN, Bolwiller, Alsace.

D. W. BEADLE, St. Catherine's, Ontario.

PROFESSOR WILLIAM J. BEAL, Agricultural College, Michigan.

PROSPER J. BERCKMANS, President of the American Pomological Society, Augusta, Ga.

CHARLES E. BESSEY, Ph.D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

DR. CH. BOLLE, Berlin, Prussia.

JOHN CROUMBIE BROWN, LL.D., Haddington, Scotland.

PROFESSOR J. L. BUDD, Secretary of the Iowa Horticultural Society, Ames.

WILLIAM BULL, Chelsea, England.

ALEXANDER BURTON, United States Consul at Cadiz, Spain, Philadelphia.

ISIDOR BUSH, Bushberg, Jefferson Co., Mo.

GEORGE W. CAMPBELL, President of the Ohio State Horticultural Society, Delaware, O.

MAXIME CORNU, Director of the Jardin des Plantes, Paris, France.

BENJAMIN E. COTTING, M. D., Boston.

REV. H. HONYWOOD D'OMBRAIN, Westwell Vicarage, Ashford, Kent, England.

ROBERT DOUGLAS, Waukegan, Ill.

MALCOLM DUNN, Dalkeith, Scotland.

W. T. THISELTON DYER, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, England.

PARKER EARLE, President of the American Horticultural Society, Cobden, Ill.

George Ellwanger, Rochester, N. Y.

Henry John Elwes, F.L.S., F.Z.S., Colesborn, Andoversford, Gloucestershire, England.

William G. Farlow, M. D., Professor of Cryptogamic Botany, Harvard University, Cambridge.

B. E. Fernow, Chief of the Division of Forestry, Department of Agriculture, Washington, D. C.

Andrew S. Fuller, Ridgewood, N. J.

Hon. Robert W. Furnas, Ex-President of the Nebraska State Horticultural Society, Brownville.

Charles A. Goessmann, Ph.D., Director of the State Agricultural Experiment Station, Amherst.

George L. Goodale, M. D., Professor of Botany, Harvard University, Cambridge.

Obadiah B. Hadwen, Ex-President of the Worcester County Horticultural Society, Worcester.

J. H. Hart, Superintendent of the Botanic Garden, Trinidad.

Robert Hogg, LL.D., Editor of the Journal of Horticulture, London.

J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

Rev. S. Reynolds Hole, Rochester, England.

Sir Joseph Hooker, K.C.S.I., The Camp, Sunningdale, England.

Josiah Hoopes, West Chester, Pa.

George Husmann, Napa, Cal.

John W. P. Jenks, Middleborough.

William J. Johnson, M.D., Fort Gaines, Ga.

Charles Joly, Vice-President of the Société Nationale d'Horticulture de France, Paris.

Dr. George King, Superintendent of the Royal Botanic Garden, Calcutta.

Professor William R. Lazenby, Secretary of the Agricultural Experiment Station, Columbus, O.

Max Leichtlin, Baden-Baden, Germany.

G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.

Victor Lemoine, Nancy, France.

J. Linden, Ghent, Belgium.

T. T. Lyon, President of the Michigan Horticultural Society, South Haven.

Dr. P. MacOwan, Director of the Botanic Garden, Cape Town, Africa.

Dr. Maxwell T. Masters, Editor of the Gardeners' Chronicle, London.

George Maw, Benthal, Kinley, Surrey, England.

T. C. Maxwell, Geneva, N.Y.

Thomas Meehan, Germantown, Pa.

Dr. Charles Mohr, Mobile, Ala.

D. Morris, F.L.S., Assistant Director of the Royal Botanic Gardens, Kew, England.

Ch. Naudin, Antibes, France.

George Nicholson, Curator of the Royal Botanic Gardens, Kew, England.

William Paul, Waltham Cross, London, N.

Professor D. P. Penhallow, Director of the Botanic Garden, Montreal, Canada.

Henry Probasco, Cincinnati, O.

P. T. Quinn, Newark, N.J.

D. Redmond, Ocean Springs, Miss.

S. Reynolds, M. D., Schenectady, N. Y.

Charles V. Riley, Washington, D. C.

William Robinson, Editor of The Garden, London.

Edgar Sanders, Chicago, Ill.

William Saunders, Department of Agriculture, Washington, D. C.

William R. Smith, Curator of the Botanic Garden, Washington, D. C.

Robert W. Starr, Port William, N. S.

Dr. Joseph Stayman, Leavenworth, Kan.

William A. Stiles, Editor of Garden and Forest, Deckertown, N. J.

William Summer, Pomaria, S. C.

Francis Summerest.

William Trelease, Director of the Missouri Botanic Garden, St. Louis.

Dr. Melchior Treub, Director of the Botanic Garden, Buitenzorg, Java,

H. J. Veitch, Chelsea, England.

Henry L. de Vilmorin, Secretary of the Société Nationale d'Agriculture de France, Paris.

Anthony Waterer, Knap Hill, near Woking, Surrey, England.

LIBRARY ACCESSIONS.

Instead of, as heretofore, dividing this list into Books Purchased and Books, etc., received by Donation and Exchange, all are incorporated in one list, in the belief that those who wish to know what has been added to the Library on any subject will find it more easy of reference. Books purchased from the income of the Stickney Fund are marked S. F.; and those purchased from the Society's Appropriation for the Library, L. A. All others were received by donation and exchange, and the source whence received is given in every instance when known.

The measurements of the books are in inches and tenths of of an inch, giving first the height, next the thickness, and lastly the width. When a pamphlet is less than one-tenth of an inch in thickness the place of that dimension is supplied by a dash.

HORTICULTURE.

Long, Elias A. How to Plant a Place. A Brief Illustrated Guide, Suited to Popular use. Tenth edition, revised and enlarged. (The Rural Library. Vol. 1, No. 4. February, 1892.) Pamphlet, light brown, 7.8×.1×5.4, pp. 28; 64 cuts. New York: [1892]. L. A.

Bailey, L. H. The Horticulturist's Rule-Book. A Compendium of Useful Information for Fruit-Growers, Truck-Gardeners, Florists and others. Completed to the beginning of the year 1892. 2d edition, revised. Brown cloth, 7.5×.7×5.2, pp. 221. New York. S. F.

Hitchings & Co., *Publishers.* Greenhouse Heating and Ventilating Apparatus. Pamphlet, red, 9.8×.2×7.3, pp. 64; cuts. The Publishers.

——— — —, ———. Greenhouse Construction. Pamphlet, green, 9.7×.1×7.2, pp. 16, (2); cuts. The Publishers.

American Horticultural Annual. A Year-Book of Horticultural Progress for the Professional and Amateur Gardener, Fruit Grower, and Florist. 1870 and 1871. 2 vols. Green paper, 7.5×.4×4.9, (I.) pp. 152; 84 cuts: (II.) pp. 152; 57 cuts. New York.

Bailey, L. H. Annals of Horticulture in North America, for the year 1890. A Witness of Passing Events and a Record of Progress. Dull green cloth, 8.2×.8×5.8, pp. 312; 76 cuts, portraits. New York: 1891. S. F.

For the year 1891. Gray cloth, 8.1×1.×5.9, pp. 415; 77 cuts. New York: 1892. S. F.

American Florist Company's Directory of the United States and Canada. Supplement, for 1893, bringing the edition of 1892 up to date. Pamphlet, 8.3×—×5.7, pp. 22. [Chicago: 1893.] William J. Stewart.

Gardener's Almanack and Poultry Keeper's and Apiarian's Calendar, for the year 1868. Edited by George W. Johnson, Esq., F. R. H. S., assisted by Edward Hewitt and T. W. Woodbury. Pamphlet, blue, 7.1×.2×5.8, pp. 101. London.

Horticultural Directory for 1868. Pamphlet, blue, green cloth back, 7.3×.4×4.8, pp. 166. London.

Horticultural Directory and Year Book for 1893. 34th year of publication. Blue green paper, 7.1×1.×4.9, pp. 480. London: [1893]. S. F.

Garden Oracle and Illustrated Floricultural Year Book, 1893. By the Editor of "The Gardeners' Magazine." 35th year of publication. Half red cloth, 7.3×.8×5.1, pp. 246; 2 colored plates, cuts. London. S. F.

Tillier, Louis, *and others.* L'Année Horticole. Revue annuelle des nouveautés en horticulture. Première Année.— 1892. Light tan-colored cloth, 7.1×.6×4.5, pp. v, 216. Paris: 1893. S. F.

Joly, Charles. Note sur le Jardin-école de Soissons. Pamphlet, blue gray, 8.5×—×5.3, pp. 6; plan and plate. Paris: 1893. The Author.

HORTICULTURAL JOURNALS.

Trade Journal, The, and International Horticulturist, for Nurserymen, Florists, and Seedsmen. [Formerly The International Horticulturist, etc.] Vol. I, No. 12, Vol. II, Nos. 1–7, Vol. III, No. 2. April, 1889 to June 15, 1890. 9 pamphlets, 11.8×—×8.5, cuts. Harrisburg, Pa.: 1889, 1890. L. H. Bailey.

Gardening World Illustrated, The. A weekly paper exclusively devoted to all branches of practical Gardening. Vols. 1–8. 1884–5 to 1891–2. 8 vols. Half green morocco, 14.2×2.1×11. London. L. A.

British Gardening. [Formerly the Northern Gardener.] Vols. 4–9, inclusive. July, 1890 to June, 1893. Unbound, blue paper, 10.9×.1 ×8.5. London: 1890–1893. L. A.

Jornal de Horticultura pratica. 23 vols. Vols. 1–18 edited by Duarte de Oliveira, Junior; vol. 19 by Joachim Casimiro Barbosa; vols. 20–23 by Eduardo Sequeira. Vols. 1, 16, 17, 19–23 bound in light gray paper, 10.8×.8×7.3, others unbound; plain and colored plates, portraits, cuts. Porto: 1870–1892. L. A.

HORTICULTURAL SOCIETIES.

World's Horticultural Society. Circular concerning the organizing of the, etc. Broadside 11.9×9. P. J. Berckmans, President.

——— ——— ———, Constitution of the. Broadside, 11.9×9. P. J. Berckmans, President.

Worcester County Horticultural Society. Transactions for 1881, 1886—1890–91 and 1892–93. Schedules of Premiums for 1889, 1890, 1892, 1893. 11 pamphlets, 9.1–10.2×.1–.4×6. Worcester: 1881–1893. Edward W. Lincoln, Secretary.

Rhode Island Horticultural Society. November Exhibition, 1893.—Chrysanthemums. Pamphlet, 8.4×—×5.4, pp. 4. C. W. Smith, Secretary.

Hartford County (Conn.) Horticultural Society. Premium List for the year 1893. Pamphlet, yellow, 9.3×—×5.9, pp. 15. [Hartford: 1893.] Edward S. Young, Secretary.

Western New York Horticultural Society. Proceedings of the Thirty-Eighth Annual Meeting, held at Rochester, . . . Jan. 25 and 26, 1893. Pamphlet, light blue, 8.5×.3×5.7, pp. 152. Rochester: 1893. John Hall, Secretary. [4 copies.]

New Jersey State Horticultural Society. Proceedings at its Eighteenth Annual Session, held at Trenton, N. J., Dec. 14th and 15th, 1892. Pamphlet, blue gray, 9.×.5×5.8, pp. (4), 152. Mount Holly, N. J.: 1893. H. I. Budd, Recording Secretary.

Pennsylvania State Horticultural Association. Reports for 1889–1892. 4 pamphlets, tea, 9.3×.2×6.1, plain and colored plates, cuts. Harrisburg: 1890–1893. E. B. Engle, Recording Secretary.

Wayne [Pa.] Horticultural Society. Premium list for 1893. Pamphlet, light brown, 9.1×—×5.9, pp. 24. Frank Smith, Secretary.

Peninsula Horticultural Society. Transactions. Third Annual Session, held at Chestertown, Md., January 28–30, 1890. Pamphlet, blue, 8.8×.3×5.8, pp. 95.

Fourth Annual Session, held at Easton, Md., January 20–22, 1891. Pamphlet, tea, 9.×.2×5.7, pp. 112.

Fifth Annual Session, held at Dover, Del., January 19–21, 1892. Pamphlet, light brown, 8.9×.2×5.7, pp. 105. Wilmington, Del.: 1892. [W. Wesley Webb, Secretary.]

North Carolina State Horticultural Society. Thirteenth Annual Report, 1893. By Gerald McCarthy, Secretary. Pamphlet, light gray, 9.1×.1×5.8, pp. 68. Raleigh: 1893. The Secretary.

Georgia State Horticultural Society. Proceedings of the Seventeenth Annual Meeting, held in the city of Rome, August 3 and 4, 1892. Pamphlet, light green, 9.2×.1×5.9, pp. 86. Atlanta: 1893. George H. Miller, Secretary.

Florida State Horticultural Society. Proceedings of the Fifth Annual Meeting, held at Ormond, Florida, May 3d, 4th, and 5th, 1892. Brown cloth, 9.3×.4×6.2, pp. 142; portrait. J. M. Hawks, M. D.

Texas State Horticultural Society, Initial Report of the, for 1886 to 1889, inclusive. Black cloth, 9.3×.3×6., pp. 106. College Station: 1889. E. L. Huffman, Secretary.

——— —— —— ——. Report of the [Fifth] Annual Meeting, for the year 1891. Pamphlet, terra cotta, 7.5×.3×4.9, pp. 107. Brenham, Texas: 1891. D. H. Watson, Secretary.

Ohio State Horticultural Society. Twenty-sixth Annual Report, for the year 1892–93. Black cloth, 9.8×.7×6.7, pp. 253; 14 cuts. Norwalk: 1893. W. W. Farnsworth, Secretary.

Columbus [Ohio] Horticultural Society. Historical Statement, Constitution, By-Laws, etc. 1892. Pamphlet, tea, 8.8×—×5.9, pp. 16. Aug. D. Selby, Secretary.

——— ——— ——— ———. Annual Report . . . containing Constitution, Lists of Members, and Quarterly Journal. Prepared by Aug. D. Selby, Secretary. Vol. 7, No. 4, December 1892, and Vol. 8, Nos. 1 and 2, March and June, 1893. 3 pamphlets, gray, orange, etc., 9.2 ×.1×5.8, pp. 101–133, 1–82; 1 portrait [in No. 4]. Columbus, Ohio: [1892 and 1893.] The Secretary.

Michigan State Horticultural Society. Twentieth Annual Report of the Secretary. 1890. Black cloth, 9.5×1.1×6.7, pp. (8), 372; portrait, cuts. Lansing: 1891.

Twenty-first Annual Report. 1891. Black cloth, 9.5×1.8×7., pp. (8), 739; cuts. [Contains general index to Vols. 10–20, 1880–1890 inclusive.] Lansing: 1891. Edwy C. Reid, Secretary.

Illinois State Horticultural Society. Transactions for the year 1892, being the Proceedings of the Thirth-seventh Annual Meeting, held at Champaign, December 6, 7, and 8. Also Proceedings of the Central and Southern District Societies, and a number of county societies for the year 1892. New Series. — Vol. XXVI. Dark green cloth, 8.9×1.7×6.5, pp. xv, 432. Warsaw: [1893.] A. C. Hammond, Secretary. [5 copies.]

Missouri State Horticultural Society. Thirty-fifth Annual Report, 1892. Dark maroon cloth, 9.2×.7×6.3, pp. 323, ii. Jefferson City: 1893. L. A. Goodman, Secretary. [40 copies.]

Nebraska State Horticultural Society. Annual Report. 1884. [Contained in duplicate copy of Annual Reports of the Nebraska State Board of Agriculture and the State Horticultural Society. 1884.] Pamphlet, tea, 8.6×.4×5.7, pp. 99. Lincoln: 1886. Hon. Robert W. Furnas, Secretary, Nebraska State Board of Agriculture.

Annual Reports, 1885 and 1886. Black cloth, 9.×.4×5.7, pp. 66, and 67–150. Lincoln, Neb.: 1887. F. W. Taylor, Secretary.

Annual Report. For the year 1893. Containing the Proceedings of the Summer Meeting held at Nebraska City, June 30, and July 1, 1892, and of the Annual Meeting held at Lincoln, January 10, 11, 12, 1893. Black cloth, 8.9×.7×5.8, pp. 284; portrait, 72 cuts. Lincoln: 1893. F. W. Taylor, Secretary.

Minnesota State Horticultural Society. Twenty-first Annual Report. 1892. Vol. XXI. Black cloth, 9 3×1.1×6.4, pp. 414; 1 portrait. Minneapolis: 1893. A. W. Latham, Secretary.

Colorado State Bureau of Horticulture. Annual Reports for the years 1891–92. Vol. VI. By Dr. Alexander Shaw, Secretary. Brown cloth, 9.2×.7×6.1, pp. 263; 4 cuts. Colorado Springs: 1892. George J. Spear.

Washington State Board of Horticulture. First Biennial Report, for the years 1891–92. Blue green cloth, 9.1×.7×6.1, pp. (8), 304; 1 plate, cuts. Olympia: 1893. C. A. Tonneson, Secretary.

Royal Horticultural Society. Journal. Vol. XV, Parts 2 and 3. January 1893. Edited by the Rev. W. Wilks, M. A., Secretary, and Mr. John Weathers, Assistant Secretary. Pamphlet, blue gray, 8.4×.9 ×5.4, pp. 73–268, iv, cciv; 32 cuts. London: [1893.] The Secretary.

Vol. XVI, Part 1. August, 1893. Pamphlet, blue gray, 8.5× .7×5.4, pp. 160, cxvi; 32 cuts. London: [1893.] The Secretary.

Norsk Havetidende. Udgivet af selskabet Havedyrkningens Venner. Redigeret af Peter Nøvik, Gartner. Vols. 2–9, 1886–1893. 8 pamphlets, buff, 8.9–9.5×.4×5.7–6.1, portraits, plates, cuts. Christiania: Peter Nøvik. [A second copy of the 8th volume from Professor Charles S. Sargent].

France, Société nationale d'Horticulture de. Journal, 3e série, Tome 15, 1893. Half claret morocco, 9.2×1.8×5.5, pp. 888. Paris: 1893. E. Glatigny, Librarian.

——, —— —— —— —. Liste générale des membres de la Société. Arrêtée au 1er Mars 1893. (Supp. Jour. Soc. nat. d'Hort. de France, Numéro de Février, 1893.) Pamphlet, gray, 9.×.4×5.7, pp. 158, (1). Paris: [1893.] E. Glatigny, Librarian.

Seine-Inférieure, Société Centrale d'Horticulture de la. Bulletin. Tome XXXIVe.—3e et 4e cahiers de 1892; Tome XXXVe.—1er et 2e cahiers de 1893. 4 pamphlets, lilac-color, 9.×.2×5.7, pp. 157–354, 1–148; tables. Rouen: 1892, 1893. The Society.

Sarthe, Société d'Horticulture de la. Bulletin. Tome 12.—1892, 3e et 4e trimestres; 1893, 1e et 2e trimestres. 4 pamphlets, orange, 8.8×— ×5.7, pp. 205–347, (5). Le Mans: 1892, 1893. The Society.

Cercle horticole du Nord, Bulletin du. 23e et 24e Années. 24 numbers, January, 1892, to December, 1893. 24 pamphlets, blue gray, 8.2× —×5.2, pp. 296 and 296; cuts. [Lille: 1892, 1893.] M. Mulnard, Secrétaire.

—— —— — ——, —— —. Supplément. Ville de Lille. Grande Exposition internationale des Produits de l'Horticulture et Industries connexes . . . septembre, 1893, etc. Pamphlet, salmon-color, 8.2× .1×5.2, pp. 36. Lille: 1893. M. Mulnard.

Liège, Fédération des Sociétés Horticoles de.— Société Royale d'Horticulture, Cercle Royal d'Arboriculture, Union Horticole.—Exposition Internationale, 24 au 28 septembre, 1893. Resultat des Concours. Pamphlet, 8.2×.1×5.4, pp. 46. Liège: 1893.

Gartenflora. Zeitschrift für Gärten- und Blumenkunde. (Begründet von Eduard Regel.) 41 Jahrgang. Herausgegeben von Dr. L. Wittmack. 24 numbers. Pamphlets, yellow, 10.1×.1×7., pp. 670, 126; 24 colored plates, 139 cuts. Berlin: 1892. Dr. L. Wittmack, Secretary of the Berlin Horticultural Society.

Genève, Société d' Horticulture de. Bulletin. 38me Année, 1892; 39me Année, 1893. 24 pamphlets, pink, 9.4×—×6.2, pp. 200, 208; cuts. Genève: 1892, 1893. The Society.

R. Societa Toscana di Orticultura. Bullettino. Anno XVIII. 1893. (Vol. VIII. della 2ª Serie). Half brown leather, 11.×1.7×7.6. pp. 380; 12 plates, colored and plain. Firenze: 1893. The Society.

Nurserymen, American Association of. Proceedings at the Fifteenth Annual Meeting, held at New York, 1890. Pamphlet, blue, 9.2×.4 ×6., pp. xviii, 132; portrait, plates. [Rochester, N. Y.: n. d.] C. A. Green, Secretary.

Seventeenth Annual Meeting, held at Atlanta, Ga., 1892. Pamphlet, tan-color, 9.×.3×6., pp. (8), 148; portrait. 1892. C. A. Green, Secretary.

FLOWERS AND ORNAMENTAL PLANTS.

Sweert, Emanuel. Florilegium Amplissimum, et selectissimum, quo non tantum varia diversorum florum præstantissimorum et nunquam antea exhibitorum genera, sed et raræ quamplurimæ Indicarum plantarum, et radicum formæ, ad vivum partibus duabus, quatuor etiam linguis offeruntur et delineantur. [3d ? edition.] Parchment, 15.4 ×1.×10., pp. (38); plates 67 and 43. Amstelodami: 1631. S. F.

Savi, Gaetano. Flora Italiana, ossia Raccolta delle piante più belle, che si coltivano nei giardini d'Italia, etc. 3 vols. [I.] pp. (12), iv, 114, (2); 40 colored plates. Pisa: 1818. [II.] pp. 90, (2); colored plates 41–80. Pisa: 1822. [III.] pp. 86, (2); colored plates 81–120. Pisa: 1824. Half calf, 18.1×1.4×13. S. F.

Bourne, H., A. B. Flores Poetici. The Florist's Manual: designed as an introduction to Vegetable Physiology and Systematic Botany for cultivators of flowers. Dull green cloth, 9.5×1.×6., pp. viii, 9–288; colored cuts. Boston and New York: 1833. S F.

Hunt, M. A. How to Grow Cut Flowers. A Practical Treatise on the cultivation of the Rose, Carnation, Chrysanthemum, Violet and other winter flowering plants. Also Greenhouse Construction. Olive-green cloth, 7.4×.7×5.5, pp. vii, iii, 228; 41 cuts. [Terre Haute, Ind.]: 1893. S. F.

Ellwanger, H. B. The Rose. A treatise on the cultivation, history, family characteristics, etc., of the various groups of roses, with accurate descriptions of the varieties now generally known. By H. B. Ellwanger; with an introduction by George H. Ellwanger. Revised edition. Olive-green cloth, 6.7×1.×4.7, pp. 310. New York: 1892. S. F.

Hatton, W. J. Secrets of Rose Culture. Brown paper, 7.6×.5×5.3, pp. 162. Huntington, N. Y.: 1891. S. F.

D'Ombrain, Rev. H. Honywood, *Editor*. The Rosarian's Year-Book for 1893. Boards, blue gray, 7.1×.3×5.3, pp. (7), 87; portrait. London and Derby: 1893. S. F.

Burpee, W. Atlee, & Co., Publishers. All About Sweet Peas. An Art Monograph by Rev. W. T. Hutchins. Pamphlet, white, 5.8×.1×4.6, pp. 24. Philadelphia: [1892.] The Publishers.

Voorhelm, George. Traité sur la Jacinte. Contenant la manière de la cultiver suivant l'expérience qui en a été faite par George Voorhelm, Fleuriste d'Harlem, connu sous les noms de Voorhelm et Van Zompel. pp. 13, (3), 123; 4 plates. Harlem: 1752.

Also, **Kampen,** Nicolas van, et fils. Traité des Fleurs à Oignons; contenant tout ce qui est nécessaire pour les bien cultiver, fondé sur une expérience de plusieurs années. pp. (8), 117; 1 plate. Harlem: 1760.

Half calf, 7.2×.8×4.6. Ernst H. Krelage.

Dahlia Register, The Annual, for 1836. Etc., etc. Dark green cloth, 10.3×1.1×6.5, pp. vi, 104; 54 colored plates. London: 1836. S. F.

Allen, C. L. Bulbs and Tuberous-Rooted Plants. Their History, Description, Methods of Propagation, and complete Directions for their successful culture in the garden, dwelling, and greenhouse. Wine-colored cloth, 8.×1.2×5.6, pp. vi, 311; cuts. New York: 1893. S. F.

Foster, Prof. Michael, Sec. R. S., F. R. H. S., etc. Bulbous Irises. Published by the Royal Horticultural Society. Blue gray paper, 8.3×.2×5.5, pp. 85, (1), 58 cuts. London: [1892.] S. F.

Tuberous Begonias; Culture and Management, etc. By numerous Practical Growers. Reproduced from The American Garden, with the addition of much new matter. (The Rural Library, Vol. 1, No. 1. February 19, 1891.) Pamphlet, 7.9×—×5.4, pp. 20, cuts. L. A.

Bellair, Georges, et Victor Bérat. Les Chrysanthèmes: Description, Histoire, Culture, Emploi. Deuxième édition. Tan-colored cloth, 7.×.3×4.5, pp. iii, 111; 21 cuts. Paris: 1893. S. F.

Imai, K., Horticulture-amateur in Japan. A Guide to Chrysanthemum Culture. Pamphlet, green, 8.5×—×5.8, pp. 13, (1); 14 cuts. Tokio, Japan: 1892. L. A.

Warner, Robert, F. L. S., F. R. H. S., Henry Williams, F. L. S., F. R. H. S., and William Hugh Gower, F. R. H. S. The Orchid Album, comprising colored figures and descriptions of new, rare, and beautiful Orchidaceous Plants. Vol. 10, parts 115–118. Half green morocco, 12.4×1.2×10., colored plates 457–472, and descriptive text. London: [1893]. S. F.

Sander, F. Reichenbachia.— Orchids illustrated and described. Second series. Vol. 2, parts 1–5. Half green morocco, 21.6×2.×17.6, pp. 44; colored plates 49–68. St. Albans, London, Berlin, New York: [1893]. S. F.

Linden, J., Lucien Linden, and Em. Rodigas. Lindenia.— Iconography of Orchids. Vol. 4, parts 19–24, Vol. 5, parts 25–30 and Vol. 6, part 31. [English Edition.] Half green morocco, 14.2×1.4×11.4, pp. 52, 52, and 12; colored plates 337–388. Ghent: [1893]. S. F.

Marquess of Lothian. The Genus Masdevallia. Issued by the Marquess of Lothian, K. T., chiefly from plants in his collection of Orchids at Newbattle Abbey; plates and descriptions by Miss Florence H. Woolward; with engravings from photographs.

Additional notes by Consul F. C. Lehmann, (German Consul in the Republic of Colombia.) Part III. Blue gray paper, 17.8×.2×12.9, 10 colored plates, with descriptive text. London: 1892. S. F.

Birkenhead, J., F. R. H. S. Ferns and Fern Culture, etc., etc. Green cloth, 7.6×.5×5.2, pp. 128; cuts. [Manchester, Eng.: 1892.] The Author. [2 copies.]

FLORAL SOCIETIES.

World's Fair Chrysanthemum Show under the auspices of the Horticultural Society of Chicago and the National Chrysanthemum Society of America. To be held in the Horticultural Building, World's Fair Grounds, Chicago, Ill., Nov. 4 to Nov. 14, 1893. Schedule of Prizes. Pamphlet, 8.4×—×6., pp. 11. Robert Craig, Director.

American Chrysanthemum Society, Report of the Committee on Classification of Chrysanthemums before the, at Washington, D. C., August, 1892. Pamphlet, blue, 8.1×.1×5.7, pp. 37. [Boston: 1893?] E. A. Wood.

Yonkers Chrysanthemum Show . . . to be held Oct. 31st to Nov. 4th, inclusive, 1893. Schedule of Prizes for Chrysanthemums. 2d edition. Pamphlet, pink, 9.2×—×5.8, pp. (10.) Yonkers, N. Y.: 1893. John Beattie, Manager.

Chrysanthemum Society, The National [English.] Annual Report and Financial Statement. Schedule of Prizes for 1893. Pamphlet, pink, 8.4×.2×5.5, pp. 68. [London: 1893.] C. Harman Payne, Foreign Corresponding Secretary.

American Florists, Society of. Proceedings of the Third Annual Convention, held at Chicago, Ill., Aug. 16–18, 1887. Pamphlet, gray, 8.9×.3×5.9, pp. 154, (1); portrait. Boston: 1887. William J. Stewart, Secretary.

Proceedings of the Fifth Annual Convention, held at Buffalo, N. Y., Aug. 20–23, 1889. Pamphlet, lilac, black cloth back, 9.2×.3×5.9, pp. 127, xxvi, (1); portrait. Boston: 1889.

Proceedings of the Sixth Annual Convention, held at Boston, Mass., Aug. 19–22, 1890. Pamphlet, gray, black cloth back, 9.1×.3×5.8, pp. 102, xxxviii, (1); portrait. Boston: 1890.

Proceedings of the Seventh Annual Convention, held at Toronto, Ont., Aug. 18–21, 1891. Pamphlet, pale green, black cloth back, 9.1×.4×5.8, pp. 164, xxviii, (1); portrait. Boston: 1891.

Proceedings of the Eighth Annual Convention, held at Washington, D. C., August 16–19, 1892. Pamphlet, gray, black cloth back, 9.1×.3×5.7, pp. 167, xxxiii, (1); portrait, Boston: 1892.

Proceedings of the Ninth Annual Convention, held at St. Louis, Mo., Aug. 9th, 10th, 11th, and 12th, 1893. Pamphlet, fawn-color, black cloth back, 9.×.4×5.7, pp. 127, xxvi, (1); portrait, 5 cuts. Boston: 1893. William J. Stewart, Secretary.

Toronto Gardeners' and Florists' Association. Fourth Annual Chrysanthemum Show, November 21–24, 1893. Pamphlet, 8.8×—×5.8, pp. (6). (Toronto: 1893.) A. H. Ewing, Secretary.

FRUITS.

Ives, John M. New England Book of Fruit; containing an abridgment of Manning's Descriptive Catalogue of the most valuable varieties of the Pear, Apple, Peach, Plum, and Cherry, for New England culture. To which are added the Grape, Quince, Gooseberry, Currant, and Strawberry; with outlines of many of the finest sorts of Pears drawn from Nature; with directions for pruning, grafting, and general modes of culture. Third edition, revised and enlarged. Faded brown cloth, 6.4×.4×4.1, pp. viii, 144; colored frontispiece and title-page, cuts. Salem and Boston: 1847. S. F.

Lyon, T. T. Fruit Report. [Bulletin 88, Michigan Agricultural Experiment Station.] Pamphlet, 9.2×.1×6.1, pp. 31. 1892. The Author.

Forsyth, William, F. A. S. and F. S. A. A Treatise on the Culture and Management of Fruit Trees; etc., etc. To which are added an introduction and notes adapting the rules of the treatise to the Climates and Seasons of the United States of America. By William Cobbett. Half calf, 8.5×1.3×5.2, pp. xii, 259; 13 plates. Philadelphia: 1802. S. F.

Morgan, Sampson, *Editor*. The Fruit Growers' Year Book Illustrated. 1893. Straw-colored paper, 8.2×.3×5.2, pp. 94; cuts. London: [1893.] S. F.

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American Agriculturist.
Rural New-Yorker.
Metropolitan and Rural Home.
Farm Journal.
National Stockman and Farmer.
Farm and Vineyard.
Germantown Telegraph.
Maryland Farmer.
Florida Dispatch, Farmer and Fruit Grower.
Prairie Farmer.
Orange Judd Farmer.
The Industrialist.
Pacific Rural Press.
Canadian Entomologist.
Good Roads.
Cottage Hearth.
Boston Daily Advertiser.
Boston Morning Journal.
Boston Post.
Boston Daily Globe.
Boston Evening Transcript.
Boston Daily Evening Traveller.
Boston Commonwealth.
Boston Times.
New York Weekly World.

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Texas.—College Bulletins 1–5, 1883–'87.

West Virginia.—Special Bulletin,—Potash and Paying Crops, 1890. All Annual Reports later than the Third, for 1890.

Ontario Department of Agriculture, Toronto. Bureau of Industries.—Agricultural Returns to the Ontario Bureau of Industries, Nov., 1892 (5th), Aug., 1883 (7th), and Nov., 1887 (20th).